

HELLO

This is a 'How to' describing how to obtain the Ducati 848/1089/1198 style Digitek dash immobilizer code. The goal of this thread is to understand how the dash works and continue with reverse engineering. Hopefully other guys can help to find the meaning of the unknown code.



WHY ?

Well, I bought my Bike with two working keys BUT the owner lost his code card ☹️ . I wanted to have the code so in the future I can copy the keys or start the bike with the code when necessary. Searching on the internet I found a lot of guys with the same problem, bought a used bike but the previous owner just had 1 key or lost the code card.

FOR NERDS ONLY

In case you think I am some kind of whizkid with square eyes playing computer games in the middle of the night.. Nope, I am a mechanical engineer who likes a beer and bikes. what I am trying to tell you: .. any moron (this means you and me) with common sense can do this.

HOW THE !@#% DOES MY BIKE WORKS ?

Soo.. first of all some background information:


The dash has a CPU (processor) and program running but the variables (settings) are stored on a memory chip (Eeprom). This Eeprom is the 24C16 and is able to store data like: Mileage, language settings, Mile/Kilometer settings, Mileage, stored keys codes, Immobilizer code etc.

The trick is to read the data directly from the chip. Its stored in Binary code (0 and 1) which can be opened in a hex editor. The good news, it is not encoded so the immobilizer can be read, (if you can read)

At the moment I can and understand:

Retrieve Immobilizer code, read the key codes, read the mileage, modify mileage

- Needed tools and software;
 - EEprom 8 pin memory clip (Ebay China)
 - USB Eeprom reader (Ebay China)
 - Torx screwdriver
 - Hex editor (Freeware) I use 'Hex Editor Neo'



24CXX 24LCXX Programmer EEPROM Reader Writer+24C02 + SOP to DIP Block USB Port

Item condition: **New**

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SOIC8 SOP8 Flash Chip IC Test Clips Socket Adpter Programmer BIOS/24/25/93

Item condition: **New**

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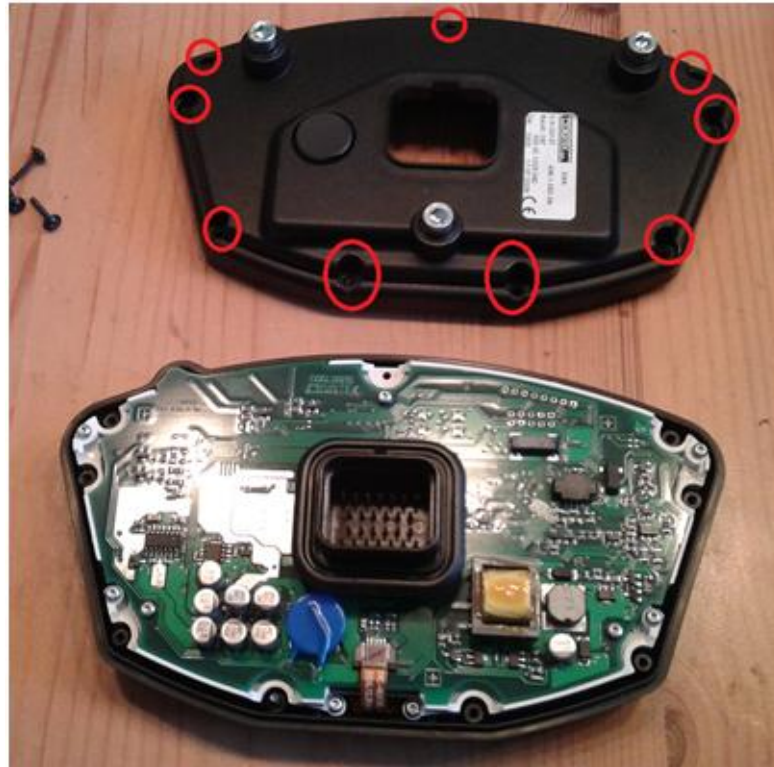
Shipping: **FREE** Economy Int'l Shipping | See details
See details about international shipping here
Item location: Shenzhen Guangdong, China
Ships to: Worldwide | See restrictions

Delivery: **Estimated between Thu, Jun 11 and Wed, Jul 1**
Seller ships within 1 day after receiving cleared payment
Please note the delivery estimate is **greater than 5 business days**.

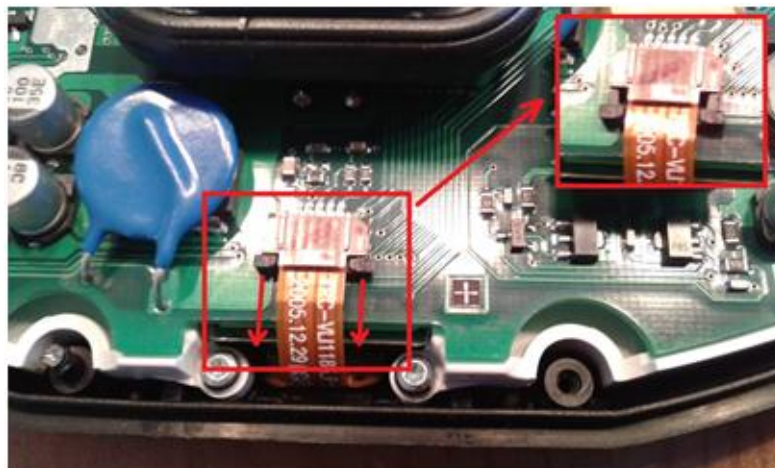
Payments: **PayPal** **VISA** **MasterCard** **AMEX**
Credit Cards processed by PayPal

Seller information
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See other items

1. Take the dash from your bike.
2. Use the torx screwdriver to open the dash (9 screws around the edge). And Remove the back cover.



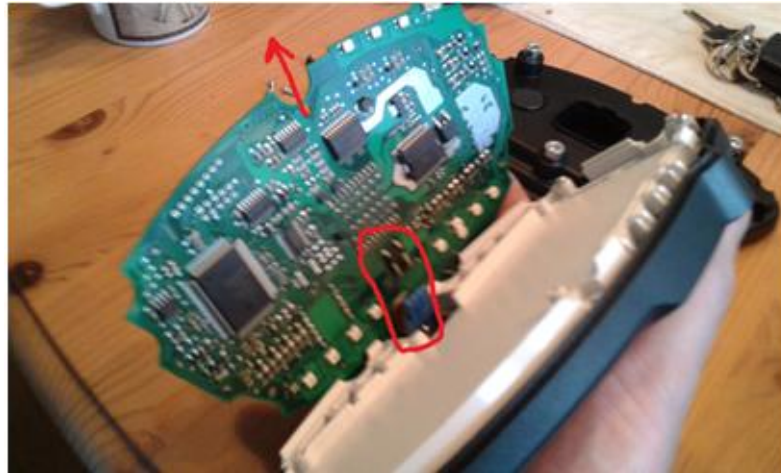
3. Remove the flat cable to the display. Slide the black part in the direction of the arrows and pull the flat cable out.



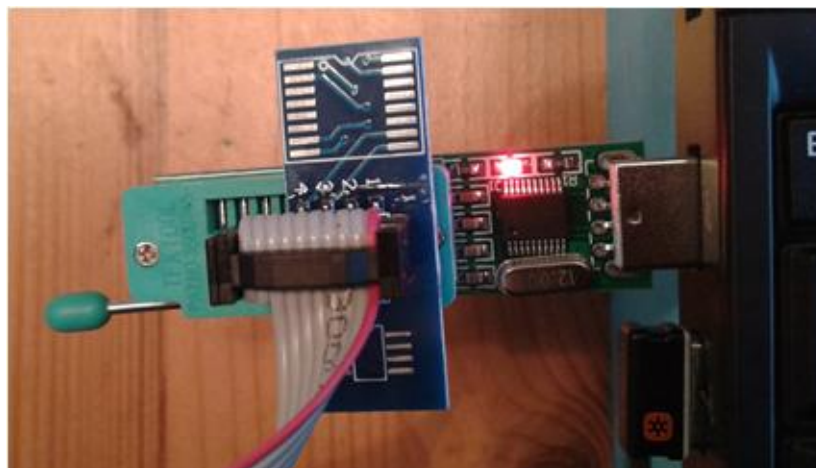
4. Unscrew the three hex screws on the PCB.



5. Lift the PCB carefully and disconnect the power cable to the PCB (just slide it off).

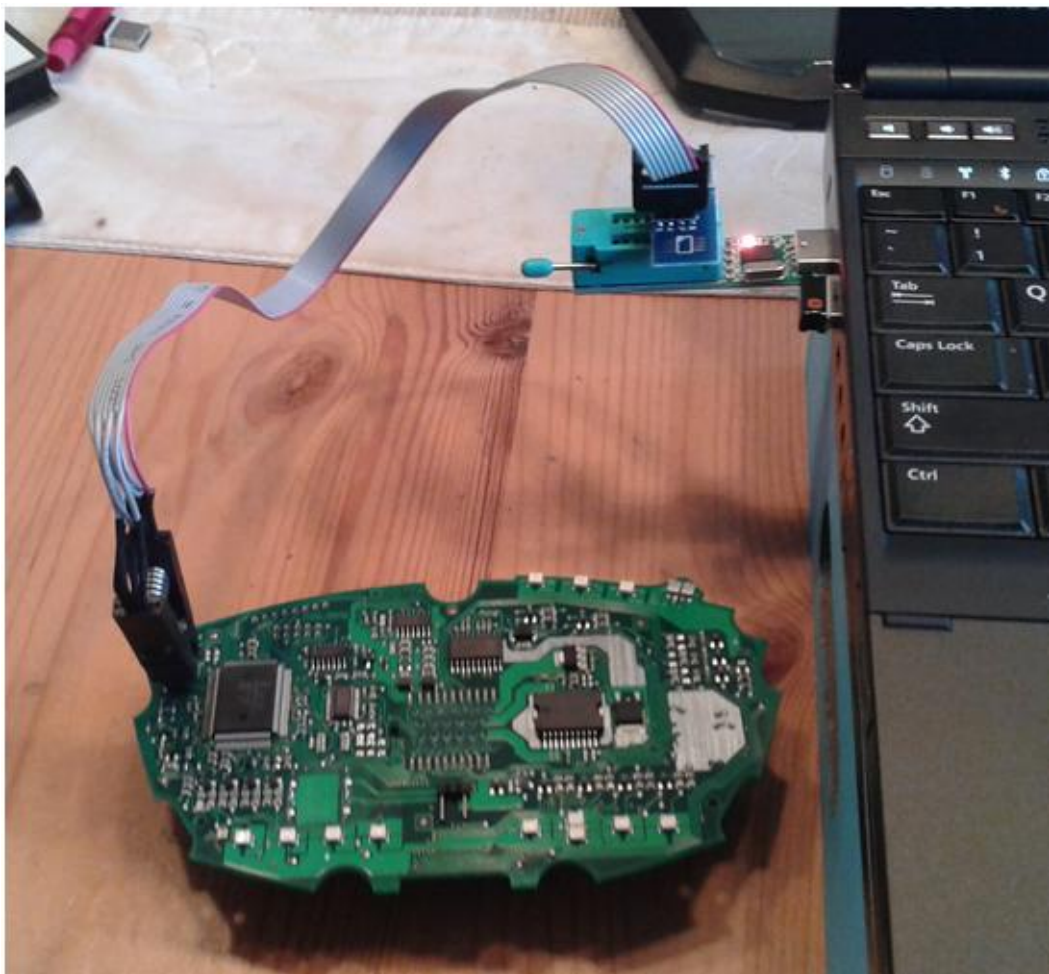
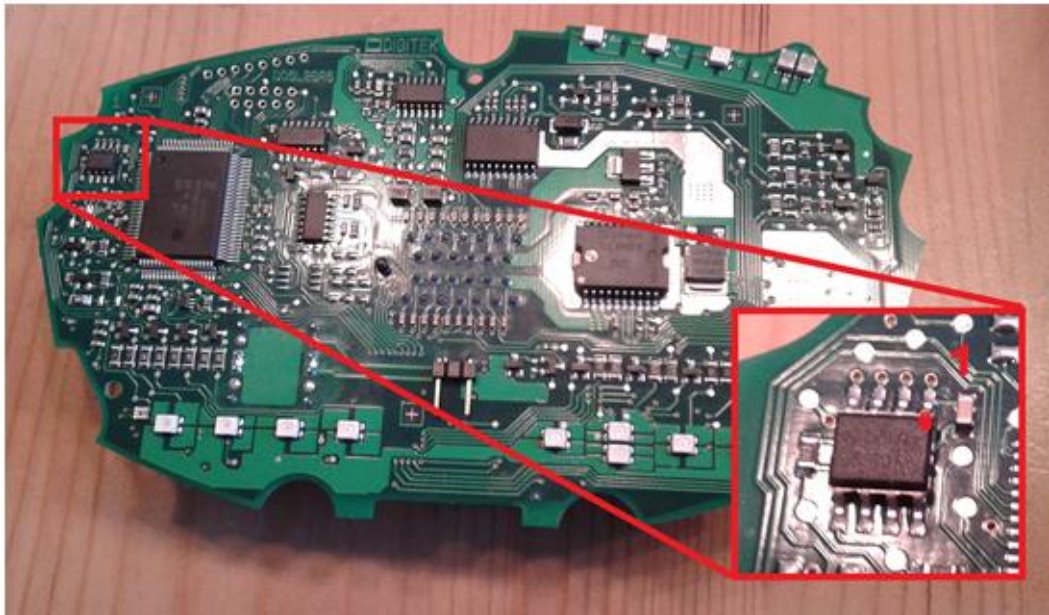


6. Mount the USB Eeprom programmer in the USB port. The pins are numbered, pin number 1 (red) is top right.

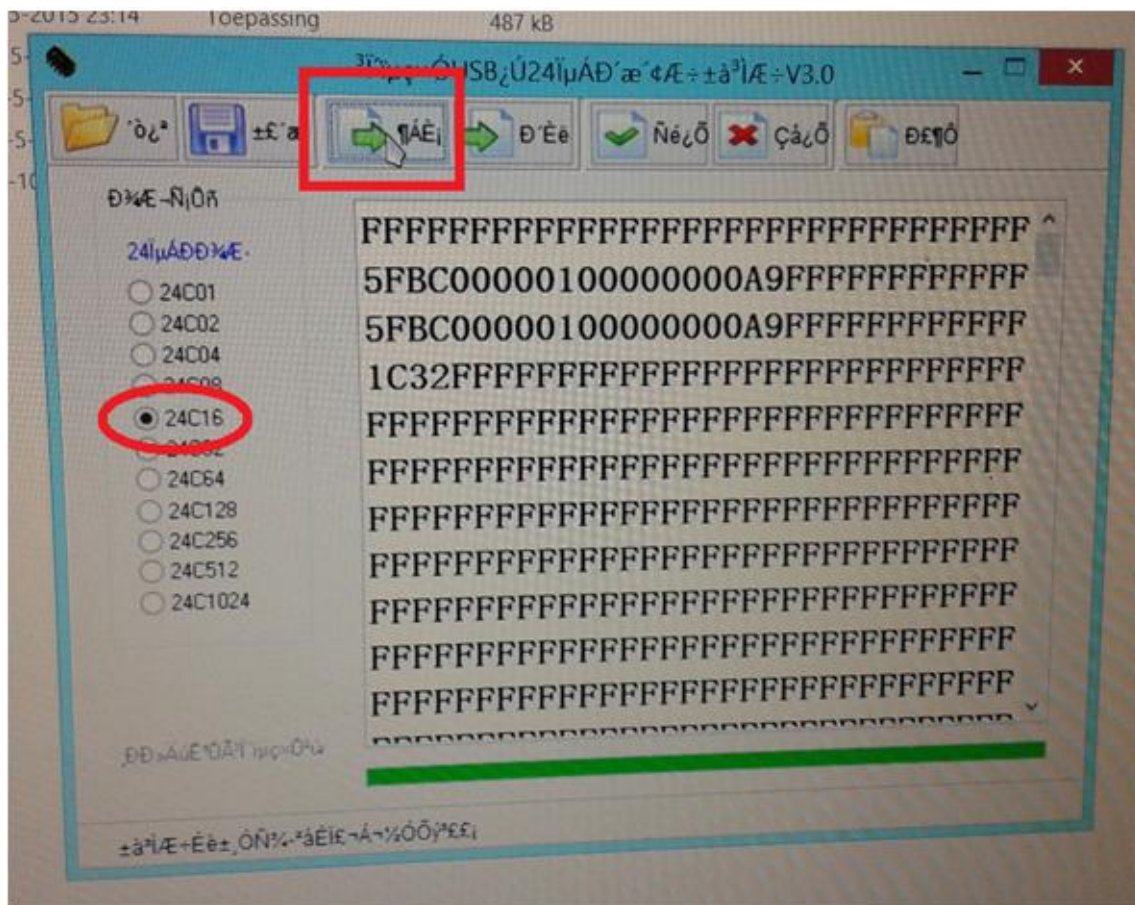


7. Install the drivers.

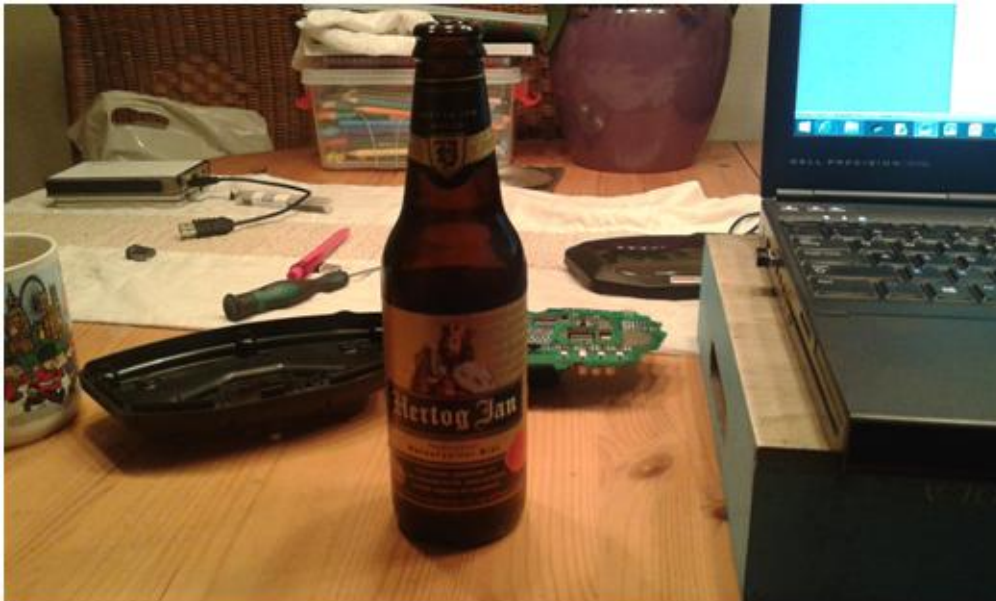
8. Connect the 8 pin Eeprom clip to the Eeprom programmer. Careful, the chip has 8 pins, numbered from ...1 till 8. The flatcable has one red cable, this is number 1.



9. Open the chipreader and select 24C16, click read the chip by click on the read button, a lot of numbers should appear in the program. Resistance is useless.



10. IMPORTANT: Back-up, Save the original binary file first. Open the *.BIN file in a hex editor.
Here is an example: ALSO IMPORTANT: Congratulations, you did it! Beertime.



11. Open the saved Binary file in a hex-editor, now it gets really interesting.

1098r.bin	
00000000	00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
00000000	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000010	5f bc 00 00 01 00 00 00 00 a9 ff ff ff ff ff ff
00000020	5f bc 00 00 01 00 00 00 00 a9 ff ff ff ff ff ff
00000030	10 32 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000040	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000050	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000060	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000070	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000080	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000090	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
000000a0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
000000b0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
000000c0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
000000d0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
000000e0	48 ab 24 01 b0 02 01 dc 35 02 37 05 04 02 ff ff
000000f0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
00000100	04 04 06 08 06 00 00 00 1c 00 ff ff ff ff ff ff
00000110	05 07 01 04 05 00 00 00 16 00 ff ff ff ff ff ff
00000120	e6 00 00 00 00 34 d6 8f 7f 02 ff ff ff ff ff ff
00000130	e6 00 00 00 00 35 0a de 03 02 ff ff ff ff ff ff
00000140	04 04 06 08 06 00 00 00 1c 00 ff ff ff ff ff ff
00000150	05 07 01 04 05 00 00 00 16 00 ff ff ff ff ff ff
00000160	e6 00 00 00 00 34 d6 8f 7f 02 ff ff ff ff ff ff
00000170	e6 00 00 00 00 35 0a de 03 02 ff ff ff ff ff ff
00000180	04 04 06 08 06 00 00 00 1c 00 ff ff ff ff ff ff
00000190	05 07 01 04 05 00 00 00 16 00 ff ff ff ff ff ff
000001a0	e6 00 00 00 00 34 d6 8f 7f 02 ff ff ff ff ff ff
000001b0	e6 00 00 00 00 35 0a de 03 02 ff ff ff ff ff ff
000001c0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

00000000	00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f	
00000000	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff	0000000000000000
00000010	5f bc 00 00 01 00 00 00 00 a9 ff ff ff ff ff ff	.....@ffffff km stand
00000020	5f bc 00 00 01 00 00 00 00 a9 ff ff ff ff ff ff	.....@ffffff km stand
00000030	1c 32 ff ff ff ff ff ff ff ff ff ff ff ff ff ff	.....ffffff
00000040	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff	0000000000000000

In line three and four is the mileage stored, it's always stored in kilometers. If the lines are not equal the mileage is not valid and will be reset to 0. This dashboard reads "5F BC" this value can be calculated manually as shown below. The value is in calculated value is shown in 100 meter so it needs to be divided by 10 for the actual displayed mileage.

Hex value	Position	Value	16^x	value 16^x	calculated value
5F BC	B	11	16^3=	4096	45056
	C	12	16^2=	256	3072
	5	5	16^1=	16	80
	F	16	16^0=	1	16 +
					48224
					4822,4 km

Its not possible to calculate your own mileage because the number ' A9' is a generated checkcode. I don't know the calculation so I cannot generate the check code.

The immobile code and key codes are saved 3 times. The codes is shown in Binary and shown in the first line of the block. It reads 04 04 06 08 06, so the code is: 44686 ☺, I tested it and it works, Eureka! The second code 05 07 01 04 05 (57145) is also a immobilizer code ! Still a mystery why the dash has two immobilizer codes ??? both codes works!

The other two codes are most likely the key codes; each key is equipped with a coded chip . When starting the bike it reads the key code and compares it with the codes stored in the dash. When the codes are corresponding with the codes stored in the dash the dash releases the immobilizer and the bike can be started.

000000f0	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff	0000000000000000	
00000100	04 04 06 08 06 00 00 00 1c 00 ff ff ff ff ff ff	.....ffffff	Immo code
00000110	05 07 01 04 05 00 00 00 16 00 ff ff ff ff ff ff	.....ffffff	unknown
00000120	e6 00 00 00 00 34 d6 8f 7f 02 ff ff ff ff ff ff	.....40 .ffffff	code key 1
00000130	e6 00 00 00 00 35 0a de 03 02 ff ff ff ff ff ff	.....5.b..ffffff	code key 2
00000140	04 04 06 08 06 00 00 00 1c 00 ff ff ff ff ff ff	.....ffffff	Immo code
00000150	05 07 01 04 05 00 00 00 16 00 ff ff ff ff ff ff	.....ffffff	unknown
00000160	e6 00 00 00 00 34 d6 8f 7f 02 ff ff ff ff ff ff	.....40 .ffffff	code key 1
00000170	e6 00 00 00 00 35 0a de 03 02 ff ff ff ff ff ff	.....5.b..ffffff	code key 2
00000180	04 04 06 08 06 00 00 00 1c 00 ff ff ff ff ff ff	.....ffffff	Immo code
00000190	05 07 01 04 05 00 00 00 16 00 ff ff ff ff ff ff	.....ffffff	unknown
000001a0	e6 00 00 00 00 34 d6 8f 7f 02 ff ff ff ff ff ff	.....40 .ffffff	code key 1
000001b0	e6 00 00 00 00 35 0a de 03 02 ff ff ff ff ff ff	.....5.b..ffffff	code key 2