

# **Diagnostic Tool Introduction**

Keeway Aftersale Service Division 2012/11/01



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#### **Diagnostic tool Appearance/Measurement**

#### Left Side View



Right Side View



Computer connection cable (1 meter)



W: Width= 90mm L: Length= 145mm H: Height=30mm



Vehicle connection cable (2 meter)

\* Specification may subject to changes without further notification



- 1. This hand-held diagnostic device is made for all Keeway EFi vehicles.
- 2. It can diagnose the problem and reflashing the ECU for current EFi configurations: MT05/MC21/MC10.
- **3. 4 Gigabyte internal memory for storage of ECU data and dynamic parameters from the ECU output.**
- 4. 3.5" LCD screen with blue backlight.
- 5. Aluminum cased structure, impact resistance.
- 6. Language option now available: Chinese/English/French/Italian/Portuguese/Spanish/German.
- 7. Anti-slippery rubber sleeve/ hand strip will be provided soon



## Engine control unit (ECU)



The ECU for managing the Cylinder 3 & 4 is located near & higher than the reserved tank



**Diagnostic coupler for ECU(34) is black and under the rider seat** 



Igniting order: 1-2-4-3 (1=first from shift pedal side)



Diagnostic coupler for ECU(12) is white and under the passenger seat

The ECU(12) for managing the Cylinder 1 & 2 is assembled together with the reserved tank





#### **Connection method**





 There are three modes that the EFi diagnostic tools are connected to PC:

### 1. Firmware upgrade:

The diagnostic tool firmware, is the operation system that controls the button reaction and some beeping function when buttons are pressed.

### 2. ECU mapping update:

By first uploading the new ECU mapping from PC to the diagnostic tool, it can then connect to the vehicle and upgrade the mapping for better performance or local market demand (for removing the exhaust pollution control or else)

#### 3. Data stream mode:

When engine running, this device can stay plugged and record real-time dynamic data during running. This PCHUD LOG file can be collected and send back to Headquarter for detailed analysis.





#### To upgrade the firmware, please follow these steps:

- 1. Press and hold the OK button
- 2. Connect to the USB and you can see the system storage disk (device name should be "CRP2 ENABLD")
- 3. Delete the firmware.bin and copy the memory.bin to the storage disk.
- 4. Remove the USB device and complete the diagnostic tool upgrade procedure(when re-boot, the memery.bin will be changed to firmware automatically)













#### Before connection, please make sure:

- 1. Side stand and in neutral gear,
- 2. Engine stop switch to "running"
- 3. Battery good charging status.
- 4. Power fuse ok.

This Diagnostic tool is powered by ECU on the vehicle, no extra power source needed.





### ECU mapping update (PC OPERATION)

#### To update the mapping, please follow these steps:



- 1. Connect to the USB and the diagnostic tool should be powered-on and enter the user interface.
- 2. Select the USB storage mode, and you can see a USB storage space, device name "Keil MCB2300 Memory".
- **3.** Copy and paste the upgraded DELPHI mapping package PAC file, provided by Headquarter, and remove the USB device securely.
- 4. When the diagnostic tool was connected to the vehicle, you can select the MT05 ECU updating function, and input the PAC files with updated mapping. (shown in the following pages)





### **ECU mapping update (on bike operation)**



1. Connect the tool to the bike, select the ECU flash function



2. Select MT05 flash function (For Silverblade/ZAFFERANO 250 and **BN600**)

MJUS Flash cal QJ125TN9\_20110509 (125T-30)(Outlook 125T-25E 120619(SB125).pac QT250T-8 120606(SB250).pac T05 QT200T-10 TN5(Outlook200).pac MT05\_QJ250-L\_foreign(Cruiser 250).pac

3. Select the update PAC file, in this case, we select the QJ250T-8 for Silverblade/ZAFFERANO 250

MT05 Flash cal	MTO5 Flash cal	MT05 Flash cal
	CommunicationOk	Transfer Application
	Security AccessOk	
ECM:MT05	Start Diagnostic SessionOk	
file Num:2	<sup>p</sup> arameter Req10k	
file Name:MT05_104_CAL.eft	<sup>p</sup> arameter Req2Err	
file Name:MT05SBE13p8_QJ250T-8_G00D_emis	Request DownloadOk	
sion_guowai_120606_70.ptp	Fransfer Routine	
	Transfer Routine: 37%	Transfer Application: 41%

4. This is the confirmation for the mapping (for developers)

#### 5. Communicating with ECU and should end with a "success" message





1. Connect the tool to the bike, select the Record data function



2. Select the "Record data" function in the sub-menu



3. The tool will start recording the real time data from ECU. Press the ESC button to stop recording.



4. Connect the Diagnostic tool to PC, enter the user interface and select the USB storage mode, and you can see a USB storage space, device name "Keil MCB2300 Memory". There will be a folder where the LOG files are stored. In this case we recorded two data streams so there are two files.

## Please send this LOG file upon request, for the headquarter to check the parameters to see if any abnormal signs of the system and the engine.











	Read DTC	
ECU Version	(①) Read DTC	ECU Flash
Record Data	USB	System
OK	] [	ESC







	Read DTC	
ECU Version	(()) Read DTC	ECU Flash
Record Data	USB	System
OK	] [	ESC







H CARLING COM	Record Data	1
ECU Version	()) Read DTC	ECU Flash
Record Date	USB	System
OK	] Г	ESC

Volts:	26.4 degC
cold:Normal_te	mperature
low idle:80 96	degC
high idle:80~9	6degC, drive:80 96degC
Fpwvc1:	0.00 ms
low idle:2 4ms	,high idle:2 4ms
Saesta:	4.0
low idle:5 12d	egC, high idle:20 30degC
Vmapexp:	77.2 kpa
cold:101kPa, 1	ow idle:40 55kPa
drive:20kPa 10	1kPa
Vrpm:	0 rpm
low idle:1500-	100rpm 1500+100rpm
drive:2500-50r	pm 2500+50rpm



Vthrot:	0.0 pct
cold:0 99.5	
Vo2:	1014.77mV
Vo2b:	1014.77mV(50~950mv)
cold:1024mv,	low idle:100~900mv/>=6
high idle:100	900mv/>=10, drive:50 950mv
Vign:	12.Ovoltage
cold:11.5~13V	, low idle:13~14.5V
high idle:13	14.5V, drive:13~14.5V
Vafcmult:	0.89factor
Affnlafr:	7.04 afr
Aftafr:	7.04 afr
Fblmcor1:	0.945factor
Fblmcor2:	0.945factor



Fcatcyl1: Fcatcyl2:	25.8 degC 25.8 degC	larpmerr: Malfcurr:	0 rpm 0x0000 0-0000
clcintl:	0 count	Malfhist:	000000
ClointZ:	0 count	Runtime:	4.0
relemull:	0.000 pct	Saidldm:	4.0
Fene:	0.000 pct	Spdwell:	1 39 mg
Fonde:	0.00mot	Statusbytel:	0x00
Epuryc <sup>2</sup>	0.00 me	Fuelcoff:	0
Fvel:	82 00 nct	Fcocrfld:	0
Fve2:	86.30 pct	Dfcocmet:	0
Iacvdsmp:	128step	Dfcoenbl:	0
laintegofst:	16.21 pct	Dfcoeenbl:	0
Iardrpm:	0 rpm	Fcohrpm:	0
107MS - 2515- (5.77)		The second second second second	
Vrlvenbl:	0	Fachtren:	0
Fclrest2:	Õ	Fo2redv1:	Ő
Statusbyte2:	0x00	if IACV mode=0:	0
Felcen1:	0	Iamtrlost:	0
Ppdsebl:	0	lacmvihb:	0
Fpenabl:	0	Vigns:	1
ftrnsaes:	0	Statusbyte4:	00x00
ftrnsdes:	0	Cycsenbl:	0
ftrnsaedcload:	0	Vesinsyn:	0
Folcen <sup>2</sup>	0	Idiconm:	0
Statuchyte3.	0+83	rpestat: Recofines:	0
Fo2etat1:	1	Preatren:	0
constant.	-	IISWICH.	0



ii Os (2:2:(7/7)	
VbVios_MIL_Status	:0
Statusbyte5:	0x00
Vafcmet:	0
Vbarocmet:	0
Vesinsynsprk:	0
Satitrig:	0
Catloenb:	0
If engstate=3:	0
Nistblidle:	0
Fo2redy2:	0
Terront:	0
Vafcelnum:	0
Vvehspd:	512KmperH
Cepde:	6 pct



ALL CONSTRUCTION	Record Data	
ECU Version	(()) Read DTC	ECU Flash
Record Data	USB	System
OK	] [	ESC

Velts: 26.4 degC cold:Normal temperature low idle:80 96degC high idle:80 96degC, drive:80 96degC Fpwvc1: 0.00 ms low idle:2~4ms, high idle:2~4ms Saesta: 4.0 low idle:5~12degC, high idle:20~30degC 77.2 kpa Vmapexp: cold:101kPa, low idle:40~55kPa drive:20kPa 101kPa Vrpm: 0 rpm low idle:1500-100rpm~1500+100rpm drive:2500-50rpm~2500+50rpm

Disp	olay/Record Data
	Display Data
	Record Data
	Read Freeze Data
OK	ESC

TTO5 data(2/8)	
Vthrot;	0.0 pct
cold:0~99.5	
Vo2:	1014.77mV
Vo2b:	1014.77mV(50~950mv)
cold:1024mv, 1	ow idle:100~900mv/>=6
high idle:100	900mv/>=10, drive:50~950mv
Vign:	12. Ovoltage
cold:11.5~13V,	low idle:13 14.5V
high idle:13~1	4.5V, drive:13 14.5V
Vafcmult:	0.89factor
Affnlafr:	7.04 afr
Aftafr:	7.04 afr
Fblmcor1:	0.945factor
Fblmcor2:	0.945factor



(TO5 data(3/8)	
Fcatcyl1:	25.8 degC
Fcatcy12:	25.8 degC
Felcint1:	0 count
Felcint2:	0 count
Felemul1:	0.000 pct
Folomul2:	0.000 pct
Fono:	33 cellNo.
Fppdc:	0.00pct
Fpwvc2:	0.00 ms
Fvel:	82.00 pct
Fve2:	86.30 pct
Iacvdsmp:	128step
laintegofst:	16.21 pct
lardrpm:	0 rpm

MT05 data(5/8)		
Vrlvenbl:	0	Service in the
Felrest2:	0	
Statusbyte2:	0x00	
Felcen1:	0	
Ppdsebl:	0	
Fpenabl:	0	
Ftrnsaes:	0	
Ftrnsdes:	0	
Ftrnsaedcload:	0	
Ftrnsdeinload:	0	
Folcen2:	0	
Statusbyte3:	0x83	
Fo2stat1:	1	
Fclrest1:	1	

Alus data(4/8/	
Iarpmerr:	0 rpm
Malfcurr:	0x0000
Malfhist:	0x0000
Runtime:	0 Sec
Saglobal1:	4.0
Saidldyn:	0.0
Spdwell:	1.39 ms
Statusbytel:	0x00
Fuelcoff:	0
Fcocrfld:	0
Dfcocmet:	0
Dfcoenbl:	0
Dfcoeenbl:	0
Fcohrpm:	0
	A STATE OF A DESCRIPTION OF A DESCRIPTIONO OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTI
105 data(b/8/	
roshtren:	0
foZredyl:	0
if IACV mode=0:	0
lamtrlost:	0
lacmvihb:	0
Vigns:	1
Statusbyte4:	0 <b>x</b> 00
Cycsenbl:	0
Vesinsyn:	0
Idlconm:	0
fpestat:	0
Fpeafren:	0
Pnswtch:	0
Diagswtch:	0

and the second second



1T05 data(7/8)	
VbVios_MIL_Statu	s:0
Statusbyte5:	0x00
Vafcmet:	0
Vbarocmet:	0
Vcsinsynsprk:	0
Satitrig:	0
Catloenb:	0
If engstate=3:	0
Nistblidle:	0
Fo2redy2:	0
Terrent:	0
Vafcclnum:	0
Vvehspd:	512KmperH
Copdo:	6 pct

Vbaro:	100.6kpa	
Vesfe:	0 count	
Vespe:	0 count	
Viat:	25.2 degC	
Vmap:	85.0 kpa	
VmapAltc:	85.2 kpa	
Vmaprang:	105 CA	
Vthrotia:	4.6 pct	
Vthrotraw:	12352count	
Pruntime:	90 Sec	



	Systern sett	ing
ECU Version	(()) Read DTC	ECU Flash
Record Data	USB	Systern
OK		ESC

	Langange choos	entra
	English	
	Chinese	
	Spanish	
	Italian	
	Portuguese	
	French	
	German	
OK		ESC



Press returning	Langange choos	5 <b>e</b> }
	English	
	Chinese	
	Spanish	
	Italian	
A STATE OF THE STA	Portuguese	REAL PROPERTY AND INCOME.
	French	
	German	
OK	]	ESC





1105 data(2/1	
Vthrot;	0.0 pct
cold:0~99.5	
Vo2:	673.28 mV
Vo2b:	673.28 mV(50~950mv)
cold:1024mv,	low idle:100 900mv/>=6
high idle:100	) 900mv/>=10, drive:50 950mv
Vign:	13.6voltage
cold:11.5~13V	, low idle:13 14.5V
high idle:13	14.5V, drive:13~14.5V
Vafcmult:	0.85factor
Affnlafr:	14.41afr
Aftafr:	14.41afr
Fblmcor1:	0.945factor
Fblmcor2:	0.945factor

1105 data(1/7)	
Volts:	34.3 degC
cold:Normal te	mperature
low idle:80~96	degC
high idle:80~9	6degC, drive:80~96degC
Fpwvc1:	3.23 ms
low idle:2~4ms	,high idle:2~4ms
Saesta:	8.8
low idle:5~12d	egC, high idle:20~30degC
Vmapexp:	43.5 kpa
cold:101kPa, 1	ow idle:40~55kPa
drive:20kPa~10	1kPa
Vrpm:	1449 rpm
low idle:1500-	100rpm 1500+100rpm
drive:2500-50r	pm 2500+50rpm

MT05 data(3/7)	
Fcatcyl1:	34.0 degC
Fcatcyl2:	33.9 degC
Felcint1:	-3 count
Felcint2:	-3 count
Felemul1:	-0.028 pct
Felemul2:	-0.028 pct
Fono:	33 cellNo.
Fppdc:	1.00pct
Fpwvc2:	4.45 ms
Fvel:	65.73 pct
Fve2:	86.30 pct
Iacvdsmp:	72 step
Iaintegofst:	26.05 pct
Tardrom:	1600 rpm



mius data(4//)		M105 data(5/7)	
Iarpmerr:	22 rpm	Vrlvenbl:	0
Malfcurr:	0x000x0	Fclrest2:	0
Malfhist:	0x0000	Statusbyte2:	0x07
Runtime:	95 Sec	Fclcen1:	1
Saglobal1:	7.7	Ppdseb1:	1
Saidldyn:	0.0	Fpenabl:	1
Spdwell:	1.20 ms	Ftrnsaes:	0
Statusbytel:	0x00	Ftrnsdes:	0
Fuelcoff:	0	Ftrnsaedcload:	0
Fcocrfld:	0	Ftrnsdeinload:	0
Dfcocmet:	0	Fclcen2:	0
Dfcoenbl:	0	Statusbyte3:	0x9d
Dfcoeenbl:	0	Fo2stat1:	1
Fcohrpm:	0	Fclrest1:	0
MIU5 data(6/7)		MIU5 data(7/7)	
lochtman'	1		
Cosneren.		VDV10S_MIL_Status	:0
Fo2redy1:	1	Statusbyte5:	:0 0x25
Fo2redy1: if IACV mode=0:		Vbvios_mil_Status Statusbyte5: Vafcmet:	:0 0x25 1
Fo2redy1: if IACV mode=0: lamtrlost:	1 1 1 0	Vbvios_mil_Status Statusbyte5: Vafcmet: Vbarocmet:	:0 0x25 1 0
Fo2redy1: if IACV mode=0: lamtrlost: lacmvihb:		Vovios_mil_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk:	:0 0x25 1 0 1
Fo2redy1: if IACV mode=0: Iamtrlost: Iacmvihb: Vigns:		Vovios_mil_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig:	:0 0x25 1 0 1
Fo2redy1: if IACV mode=0: Iamtrlost: Iacmvihb: Vigns: Statusbyte4:	1 1 1 0 0 0 1 0x07	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb:	:0 0x25 1 0 1 0 0
Fo2redy1: if IACV mode=0: Iamtrlost: Iacmvihb: Vigns: Statusbyte4: Cycsenbl:	1 1 1 0 0 0 1 0x07 1	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb: If engstate=3:	:0 0x25 1 0 1 0 0 1
Fo2redy1: if IACV mode=0: Iamtrlost: Iacmvihb: Vigns: Statusbyte4: Cycsenb1: Vcsinsyn: Idloarr:	1 1 1 0 0 0 1 0x07 1 1	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb: If engstate=3: Nistblidle:	:0 0x25 1 0 1 0 0 1 0
Fo2redy1: if IACV mode=0: Iamtrlost: Vigns: Statusbyte4: Cycsenb1: Vcsinsyn: Idlconm:	1 1 1 0 0 0 1 0x07 1 1 1	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb: If engstate=3: Nistblidle: Fo2redy2:	:0 0x25 1 0 1 0 0 1 0 0
Fo2redy1: if IACV mode=0: Iamtrlost: Vigns: Statusbyte4: Cycsenb1: Vcsinsyn: Idlconm: Fpestat: Encafren:	1 1 1 0 0 0 1 0x07 1 1 1 1 0	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb: If engstate=3: Nistblidle: Fo2redy2: Terrcnt: Vafcolpur:	:0 0x25 1 0 1 0 0 1 0 0 0
Fo2redy1: if IACV mode=0: Iamtrlost: Vigns: Statusbyte4: Cycsenb1: Vcsinsyn: Idlconm: Fpestat: Fpeafren:	1 1 1 0 0 0 1 0x07 1 1 1 0 0 0	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb: If engstate=3: Nistblidle: Fo2redy2: Terrcnt: Vafcclnum:	:0 0x25 1 0 1 0 0 0 1 0 0 0 1 5 1 2K
Fo2redy1: if IACV mode=0: Iamtrlost: Iacmvihb: Vigns: Statusbyte4: Cycsenb1: Vcsinsyn: Idlconm: Fpestat: Fpeafren: Pnswtch:	1 1 1 0 0 1 0 x07 1 1 1 1 0 0 0	Vovios_MIL_Status Statusbyte5: Vafcmet: Vbarocmet: Vcsinsynsprk: Satitrig: Catloenb: If engstate=3: Nistblidle: Fo2redy2: Terrcnt: Vafcclnum: Vvehspd: Condo:	:0 0x25 1 0 1 0 0 1 0 0 0 1 512KmperH