

Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters

<u>User Manual</u>

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I. Introduction

The Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters is a professional diagnostic software designed to work with the Abrites Vehicle Diagnostics Interface produced by Abrites Itd.

The Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters allows complete dealer level diagnostic operations for multiple brands and categories of motorcycles, snowmobiles, ATVs, UTVs and water scooters via their on board diagnostic (OBD) connectors or through bench connection.

The diagnostics is being performed over the appropriate communication protocol for each model.

As well as the standard diagnostic functions such as reading and clearing DTCs, module identification etc. the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters provides advanced diagnostic functions such as reading and updating configuration data of various modules installed on the vehicles, key learning functions for some models and others functions.

Getting started with the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters requires the users to perform the following:

1. Double click the "Quick start" icon on the desktop and go to the motorcycle icon.

2. Double click it and the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters will be started.



3. Before using the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters please go to the "Options" menu and make sure that the "Debug logging" is enabled for troubleshooting purposes (described in section V), then select how long you would like for them to be kept on your computer. In the last drop down tab of the "Options" menu you can select the language that is most comfortable for you to use while working with the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters.





II. Vehicle diagnostics with the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters

The Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters software consists of basically two parts.

1. Standard diagnostic functions – Reading DTCs/ Clearing DTCs (fault codes)/ Scanning available modules and extended module identification, Data display in the supported vehicles.

When performing standard diagnostics the first step that needs to be performed is to select the type of vehicle that requires the diagnostic service. By default your first screen will be set to the "Vehicle selection" tab:

	Unit name			Protocol	DTC	
					1	
						Previo
						S
						Oper
						Neut
						Next
1	Vehicle Selection	Special Functions				
CL	rrent context				i.	63
	Category	Bike	-			S
1	category					Option
1	Make	<u> </u>	~			
		-				

From this screen you will need to select the vehicle "Category" (e.g. Bike, Snowmobile, Water Scooter), the "Make" (e.g. Aprilia, BMW, Ducati, Kawasaki, Gilera, Piaggio, Suzuki, etc.) and the "Model".

NOTE: For the purposes of the manual we are using a Suzuki motorcycle, the model is DL650K7-L2. This motorcycle has two electronic modules available. The principle is similar with any vehicle tested by the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters. The two available electronic modules of this motorcycle are the **Engine Control Unit** and the **Anti-lock Braking System.** In the "Protocol" field of the diagnostic screen we can determine that both units use the KWP protocol.

- Select the vehicle as described above:

AB	RITES Diagnostic	s for Bikes, Snowmobiles and Water scooters 1.3	www.abritus72.com	-	
#	Unit name		Protocol	DTC	
12	Engine Cor	trol Unit	KWP		
29	Anti-Lock	Braking System	KWP		Previous
					Open
					Next
	/ehicle Selection	B Spedal Functions			
Cur	ategory	Bike			Options
N	lake	SUZUKI 🔻			
M	lodel	DL650AK7-L2	•		Evit

- Once the correct vehicle is selected the available electronic modules will be displayed in the "Unit name" field.

- Drill into the units in order perform diagnostics for them by double – clicking directly over the name of the unit:

Establishing di	agnostic session nel is open - K-1	with selected unit	^
electron	ic control unit i	dentification	
Part Number		32920-27ca*	
Component ID		32920-27GA	
Identification	Data Display		Clear log
Identification Read DTCs	Data Display Actuator tests		Clear log Write log

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The display field will inform you about the establishment of a diagnostic session with the selected unit. It will also provide information about the protocol and on multiple occasions it will automatically display the unit identification in terms of Part number and Component ID.

- Selecting the "Identification" button will allow you to see the unit's Part number and Component ID (This is mostly used for searching for replacement parts):

stablishing di iagnostic char	agnostic session v nel is open - K-li	with selected unit	
electron	ic control unit ic	dentification	
art Number		32920-27GA*	
omponent ID		32920-27GA	
electron	nic control unit ic	dentification	
electron	nic control unit ic	dentification	
art Number		32920-27GA*	
art Number omponent ID		32920-27ga* 32920-27ga	
art Number omponent ID		32920-27ga* 32920-27ga	
art Number omponent ID		32920-27GA* 32920-27GA	
art Number omponent ID Identification	Data Display	32920-27GA* 32920-27GA	Clear log
art Number component ID Identification Read DTCs	Data Display Actuator tests	32920-27GA* 32920-27GA	Clear log Write log

-Selecting the "Read DTC" button will read the Diagnostic Trouble Codes from the unit (if present), it will display it with the factory number of DTC as well as the appropriate text identification (if available):

electron	ic control unit id	entification	
Part Number		32920-27GA*	
Component ID		32920-27GA	
electron	ic control unit id	entification	
Part Number		32920-27GA*	
Component ID		32920-27GA	
read dia 21650: Ignition	gnostic trouble co switch signal cir	des cuit malfunction [Not Present]	
read dia P1650: Ignition	gnostic trouble co	des cuit malfunction [Not Present]	
read dia P1650: Ignition Identification	gnostic trouble co switch signal cir Data Display	des cuit malfunction [Not Present]	Clear lo
read dia P1650: Ignition Identification Read DTCs	gnostic trouble co switch signal cir Data Display Actuator tests	des cuit malfunction [Not Present]	Clear lo Write lo



- Once the vehicle is repaired and the issue is removed the "Clear DTC" button is selected. This will remove the Diagnostic Trouble Code from the unit's memory thus allowing the vehicle to operate correctly:

omponent ID		32920-27GA	
electronic			
	control unit id	dentification	
art Number		32920-27GA*	
omponent ID		32920-27GA	
read diagn	nostic trouble co	odes	
1650: Ignition s	witch signal cir	rcuit malfunction [Not Present]	
1050			
clear diag	gnostic trouble o	codes	
TCs cleared			
Identification	Data Display		Clear log
Read DTCs	Actuator tests		Write log
			×

- The "Data Display" button provides a complete "actual value data" view of the vehicle in one, multiple or all parameters by gathering information from the vehicle's sensors. This function is extremely helpful when determining a hidden fault within a vehicle or analyzing the "behavior" after specific modifications or repairs have been made:

+	Parameter	Value	-
~	Engine speed	0 rpm	
~	Throttle position	27.5 °	
~	Manifold absolute pressure 1	94.1 kPa	
~	Engine coolant / oil temperature	12.0 °C	
~	Intake air temperature	14.0 °C	10
~	Barometric pressure	126.3 kPa	
~	Battery voltage	0.0 V	
~	O2 sensor	0.0 V	
~	Gear position	Neutral	
~	Manifold absolute pressure 2	94.1 kPa	
~	Desired idle rpm	1343 rpm	
~	ISC valve position	98 step	
~	Fuel injection time for #1	0.0 ms	
~	Fuel injection time for #2	0.0 ms	
4	Fuel injection time for #3	262.1 ms	
~	Fuel injection time for #4	262.1 ms	
~	Ignition timing for #1	5.1 °	
~	Ignition timing for #2	5.1 °	
~	Secondary throttle actuator position sensor	11.4 %	
~	ISC aperture learned position	100.0 %	
2	Decomp solenoid relay	Off	



- The "Data Display" menu provides two different views. The "List" view, as shown above allows selection of sensors with a check box list. The list can be customized and its order can be modified by the user for a more accurate overview of the vehicle values. The "Graph" view allows the monitoring of a parameter in a graphic form in order to determine patterns and behavioral changes. It provides the available sensor signals in a drop down menu where a value can be selected:



- "Custom Request" allows the user to send custom signals to the electronic units and monitor the response in a table view. The custom request can be saved for reference:

Custom Request	×
Request	Send
Save Clear	Close

UI	nit name	Protocol	DTC	
-			Sector of	
				Previou
				-
				Open
				Next
				THEAT
	Constal Superior			
veni	de Selection IIa Special Punctions			1
1			6	
IJ	S Connor			**=
y Lea	arning Read/Update		Open	Option
	Compata			

2. The "Special functions" tab of the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters will provide you the options to perform "Advanced diagnostics" with the available vehicles:

- The "Key learning" special function allows the user to prepare keys for the available vehicles in a simple "step – by – step" manner. Key learning is currently available for various Aprilia, BMW, Gilera and Piaggio models:

lease, select m	nake and click on the button Next	
like	APRILIA BMW GILERA PIAGGIO	
	Back Next 🛸	🗡 c

Note: Make sure to follow the instructions you see on the screen. Make sure to have your transponder

programmer attached.

-Programming a key with a Temic transponder requires the TAG key programmer to be connected to your AVDI. Once you have done that the Software will establish a connection to the unit and you will see the following screen:

Unit	name	Protocol DTC	
	Key Learning		Pre
	Please Wait		
			- I
ehide Sel	در 	Back Next Cancel	Op
	ConfData		

Once the connection to the unit is established you will be asked to select the key position and you should see the following screen:

Once that is done the software

will ask you what programming operation you would like to perform. You can clone or replace the existing transponder by selecting the appropriate button:





In this case we see that a master key is used and you should leave the position to its default. After clicking "Next" the software will inform you how to place the transponder within the key programmer antenna (aerial):



When you click next here you will need to wait a few seconds and the transponder will be ready for use.

Key Learning	<u>×</u>
	Programming completed successfully!
	nansponder Key is ready to start the engine.
	Next 🔊 Finish

-Programming keys for BMW motorcycles.

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In this case we are using a Hitag 2 transponder and a TAG transponder programmer. The first step is to connect the programmer and establish a diagnostic connection with the unit:

# Unit	name	Protocol	DTC	
	Key Learning		x	Previous
	Please Wait		8	G
	Establishing diagnostic session w	ith selected unit	e	Next
Vehide S		는 Back Next 🌩	Cancel	Options



The next step is to select the position where you would like to program the key:

You should then follow the instructions on the programmer placement in the antenna:

Key Learning		×
	Place Transponder Key on your programmer and click on the button Next. NOTE: Ensure that no other Transponder Key is within 10 cm.	
	🔶 Back Next 🔶	Cancel

You will then be informed that the transponder is ready to start the engine:





-"Read/ Update ConfData" allows the reading and updating of Configuration data from selected electronic control modules of various bikes, snowmobiles and water scooters. The "Read Confdata" button will read the Configuration data from the selected module, the "Update Confdata" will respectfully update the configuration data of the selected module. The selection is performed using a drop down menu within the "Read/ Update ConfData" special function menu. The "Load from file" button allows you to update the configuration data by loading it from a preselected file, saved prior the update. "Make Virgin" allows you to virginize the CONF DATA of the ECUs available for this action

ad/Upda	te ConfData	×
Unit	•	
	EFI TECHNOLOGY ACII/AC2I/AC5I/AC8I/AC13I/AC21I/AC23I (ST72C334)	Read ConfData
	EFI TECHNOLOGY ACII/AC2I/AC5I/AC8I/AC13I/AC21I/AC23I (95040)	36
	EFI TECHNOLOGY AC19I/AC20I/AC25I/AC27I/AC32I (95080)	Lindate ConfData
	MAGNETI MARELLI ACI100/ACI50x/ACI60x (MC68HC05)	opublic combata
	MAGNETI MARELLI IAW 15 (MC68HC11)	
	MAGNETI MARELLI IAW 5AM (ST10F269, 95160)	Load from File
	MAGNETI MARELLI IMM003/IMM006 (MC68HC05E6)	
	PHILIPS DITECH (908AZ60A)	Save to File
		Make Virgin
		Close

Init	MAGNETI MARELLI IAW 5AM (ST10F269, 95160)	ead ConfData
	Please Wait	pdate ConfDat
	Cancel	Save to File Make Virgin
	The "Make Virgin" button allows you to virginize various ECUs with the click of a button.	

III. Connecting your AVDI to various Bikes, Snowmobiles and Water Scooters

1. Unlike cars, where the standard for the diagnostic connection is unified under the OBDII connectors the motorcycles, snowmobiles and water scooters use a variety of connectors. The connection to the on board diagnostic connectors of these vehicles can be established in the following steps:

- Determining the location of the diagnostic connectors.

In the majority of cases the diagnostics connectors are located under the seat of the vehicle.

- Determining the type of connectors required for the specific vehicle.

Once the type of connector that is required for the vehicle in question is discovered the users can proceed to the next step.

- "Translating" the signal from the On board diagnostic connector to the AVDI.

2. In the photos below you can see various connector locations, types and connection cable pin outs.

- Suzuki motorcycles, quads, snowmobiles and water scooters most commonly have their 6 pin connector under the seat:



In the photo below you can see it in white, it has a rubber waterproof cap which needs to be removed in order for the connector to be exposed.

The standard Suzuki six pin connector is depicted below:



The pin out for the 6 pin connector is as shown here:



Manual ¹⁵ Version: 3.0 Here you can see the two connected on the vehicle:



The connection from the Suzuki vehicles to your AVDI is established by connecting the 6 pin connector to a DB9 connector and then to a DB25 connector in order for the signal to enter the DB25 connector on the AVDI via the following table:

DB9	DB25
PIN 1 – Ground	PIN 5- Ground
PIN 4 – K—line	PIN 8 – K – line
PIN 9 – 12V	Pin 17 – 12 Volts

- BMW motorcycles use a 10 pin diagnostic connector. The connection to the OBD II is depicted:



Location of the OBD for some of the most popular BMW models:

S1000RR- under the rear seat cover R1200GS Adventure- under the rear portion of the seat R1200GS- under the seat R1200RT- under seat R1200C- under the left chrome cover HP2 Enduro- under the front of the seat, close to the tank K1200GT- under the rear of the seat K1200LT- under the rear of the seat K1200LT- under the seat R1150 GS / Adventure- under the seat R1150RT- between rear light and seat G650X Challenge/Country/Moto- behind right front panel C1-200- behind the backrest of the seat



- Aprilia motorcycles 6 pin to OBDII connection depicted below:



- Kawasaki vehicles, in most cases, have the diagnostic pin under the seat.

- PINOUTS

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For the following connections you will need to connect the modules using a DB9 connector. What you will need to remember is that the DB9 connector is structured in the following way:

PIN1 – GND PIN4 – K-line PIN9 - +12V

- Magneti Marelli ACI600.01





- Magneti Marelli IM006.04



- Magneti Marelli IAW 5AM.GE BC.0098058.A



- EFI Technology 26-08 CM078307





- EFI Technology 28-08 CM078311



-Philips 325-024-0G 2 stroke DI



IV. List of supported models

- Suzuki

AN250K3-L1 AN250MK7-L1 AN400K3-L2 AN400AK9-L2 AN650K3-K4 AN650K5-L1 AN650AK4 AN650AK5-L2 DL650K4-L1 DL650AK7-L2 DL1000K4-L2 DR125SMK9-L1 FL125SDWK7-K9 GSF650/SK7-L2 GSF650A/SAK5-K6 GSF650A/SAK7-L2 GSF1200A/SAK6 GSF1250K7-L1 GSF1250SK7-L2 GSF1250AK7-L1 GSF1250SAK7-L2 GSR400K6-L0 GSR400AK7-L1 GSR600K6-L0 GSR600AK7-L0 GSR750L1-L2 GSR750AL1-L2 GSX650FK8-L2 GSX650FAK9-L2 GSX-R600/750K4-L2 GSX-R1000K3-L2 GSX1250FAL0-L2 GSX1300BKK8-L0 GSX1300BKAK8-L0 GSX1300RK8-L2 GSX1400K4-K7 GW250L2-L3 GZ125K7-L1 RMX450ZL0-L2 RM-Z250L0-L3

RM-Z450K8-L3 RV125K7-L3 RV200K8-L3 SFV400AL0-L2 SFV650K9-L2 SFV650AK9-L2 ST250XK8-L0 SV650K3-K9 SV650SK3-L2 SV650AK7-K9 SV650SAK7-L2 SV1000/SK3-K7 TU250G/G2K9-L1 TU250XK9-L2 UH125/200K7-L2 UL250K8 UX125/150K8-L1 VL400K9-L1 VL800K5-L2 VL1500K5-L0 VLR1800K8-L1 VZ400K9-L1 VZ800K5-L2 VZ1500K9-L0 VZR1800K6-L2 LT-A400/FL0-L3 LT-A450XK7-L0 LT-A500XPK9-L3 LT-A700XK5-K7 LT-A750XK8-L3 LT-A750XPK9-L3 LT-F400/FL0-L3 LT-R450K6-L2 LT-Z400K9-L2

- BMW

R1200GS

R1200GS HP2 MegaMoto R1200GS HP2 Enduro R1200GS Adventure R1200GS R1200R R1200RT R1200S HP2 R1200S R1200ST

R1200C R1200CL R1150GS Adventure 2 spark R1150GS Adventure R1150GS 2 spark R1150GS R1150R 2 spark R1150R R1150RT 2 spark R1150RT R1150RS 2 spark R1150RS R1100S 2 spark R1100S R850R 2 spark R850R R850RT 2 spark R850RT R850C F800GS F800R F800ST F800S F650GS 800cc F650GS Dakar 2 spark F650GS Dakar F650GS 2 spark F650GS F650CS 2 spark F650CS K1300GT K1300R K1300S K1200GT K1200GT (non-CAN) K1200LT K1200R Sport K1200R K1200RS K1200S G650GS G650 Xchallenge G650 Xmoto G650 Xcountry G450X

November 10. 2014	ABRITES Diagnostics for Bikes, Snowmobiles and Water Scooters for software version 1.3
C1-200 C1-125	
S1000RR	
- Kawasaki	
BJ250 Estrella Concours ER-6f ER-6f ER-6n Epsilon 250 GTR 1400 KSF450-B KX 450 F LX250 Ninja ZX-10R Ninja ZX-6R Ninja ZX-6	

NOTE: Please be informed that module support may vary according to the model year.

V. Troubleshooting steps

1. Connection issues

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One of the most common faults that may occur with the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters is the impossibility of the software and interface to connect to the vehicle, subjected to diagnostics. In the example below the vehicle is defined and a module is being selected for diagnostics:

ADITITES D	agnostics for bixes, shownoblies and water scoolers 1.	www.abittus/2.com	Contraction of the second s
Unit	name	Protocol DTC	
12 Digi	tal Engine Electronics (DME)	CAN	
29 Anti	-lock braking system (ABS)	CAN	Previc
39 Elec	tronic suspension adjustment (ESA)	CAN	Trend
40 Igni	tion lock / electronic immobilizer (E	(S) CAN	
60 Inst	rument cluster control unit (KOMBI)	CAN	G
72 Basi	c module (GM) control unit	CAN	Oper
🖈 Vehicle S	election 🛛 🏦 Special Functions		Nex
-Current con	text		3
Catego	ry Bike 👻		Optio
Make	BMW		
	D400000 (0040-1)	_	

Once the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters attempts to establish a diagnostic connection, however, the following error message is displayed:

Target unit doe Diagnostic not	agnostic session t s not respond! opened.	ith selected unit			
				-	
Identification	Data Display			Llear log	
55 C					
Read DTCs	Actuator tests		1	Write log	
Read DTCs	Actuator tests			Write log	

Other connection issues may occur when the transponder programmer is not connected to your AVDI during key learning. You will see the following error:

Uni	t name		Protocol	DTC	
	Key Learning				Pre
	Please, select ma	ake and click on the but	ton Next		
	Bike	APRILIA			- (
	ABRIT	ES Diagnostics for Bikes, Snowmo	biles and Water scoo 🛛 🖾		Op
		Cannot find transponder pr	ogrammer. OK	1	Ne
	Selec		Back Next 🌩	X Cancel	
	ing l				Opt
hicle	ing (ConfData				Opt

Possible causes for this issue may be:

- The AVDI is not connected to the user's computer.

- The diagnostic connector is inappropriately connected.

-The transponder programmer is not connected.

In both cases please make sure to check the connections or contact <u>support@abritus72.com</u>.

2. Loa files

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The log files are an essential part of the troubleshooting process. They are required to establish the root causes of issues, that have occurred unexpectedly. In most cases this is concerning the communication between the AVDI and the modules of the vehicle or the communication between the modules within the vehicle itself. Always make sure to attach the files from when the issue occurred to an e-mail sent to the support team. This will speed up the process of resolving an issue in case it is present. Please note that the log files can be located under: Start -> Programs -> ABRITES software for IDxxxxxx-> Log Files (where IDxxxxxx is your ADVI ID) or in the second page of the "Quick Start" menu under the "LOG" icon. In this directory you will see a list of folders. Please access the "BIKE" folder and copy the ".log" files from the time and date the issue occurred and attach them in your e-mail.

The log files icon in the "Quick Start" menu:



A selection of log files from the Abrites Diagnostics for Bikes, Snowmobiles and Water Scooters:

Nan	ne l
	bike-comm-20140218-141751.log
	bike-comm-20140218-141912.log
	bike-comm-20140218-142024.log
	bike-comm-20140219-104229.log
	bike-comm-20140304-174944.log
	bike-comm-20140304-175011.log
	bike-comm-20140304-175059.log
	bike-comm-20140306-101200.log
m	bike-comm-20140306-111608.log
1	bike-comm-20140306-120455.log
	bike-comm-20140306-120950.log
	bike-comm-20140306-141702.log
1	bike-comm-20140306-174853.log
1	bike-comm-20140310-153012.log

Please contact support@abritus72.com with any questions, issues or doubts in regards to the ABRITES Diagnostics for Bikes, Snowmobiles and Water Scooters.