Thermal Bus Systems



Valeo Diagnostic Tool

Installation and Operating Instructions



17.07.2023 DOK50074

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2 Terminology

2.1 Terms and definitions

Failure

e An interruption of a required function because specified operational parameters are out of a specified range

2.2 Abbreviations

CAN ECU GND HVIL T_ihxA1	Controller Area Network Electronic Control Unit Ground High Voltage Interlock Sensor measuring the temperature of the air sucked from the passenger compartment before the IHX
T_ihxA2	Sensor measuring the temperature of the air blown inside the air duct / passenger compartment after the IHX
PTC-Compr.	Positive Temperature Coefficient (electric heat element) compressor
T_ohxR	Sensor measuring the refrigerant temperature near the OHX
T_ihxR	Sensor measuring the refrigerant temperature near the IHX
T_compR2	Sensor measuring the refrigerant temperature after the compressor
T_compR1	Sensor measuring the refrigerant temperature before the compressor
SV for Deicing	Solenoid Valve for Deicing
SU-EEV	Electronic Control Unit for Electronic Expansion Valve
PL_PS	Pressure Line Pressure Switch
PL_AC_RS	Suction Line HP Mode Recognition Switch
SL_HP_RS	Pressure Line AC Mode Recognition Switch
T_mceR2 FI	Sensor measuring the refrigerant temperature after the main cycle EEV Frequency Inverter
P_compR1 P_compR2	Sensor measuring the refrigerant pressure level before the compressor Sensor measuring the refrigerant pressure level after the compressor



3 Document Scope

This document describes the installation process and explains how to use the diagnostic tool.

4 System requirements

4.1 Software

Use a PC (or Laptop) equipped as follows:

Operating system: Windows 10 or later

USB port: one (1) free USB 2.0 or 3.0 port (when the standard version is used) two (2) free USB 2.0 or 3.0 ports (when the extended version is used)

Free hard disc space: ca. 300 MB

4.2 Hardware

4.2.1 CAN to USB-Adapter

The connection between the CAN-Bus of the System and the PC, running the tool, shall be performed via a CAN-Bus to USB Adapter from PEAK-System Technik GmbH.



4.2.2 VDT cable harness adapter

The cable harness adapter shall establish the CAN-Bus connection between the PEAK-Adapter (see 4.2.1) and the HVAC unit. For further details on the cable harness, please refer to the delivery scope.





4.2.3 Connection setup

The HVAC unit is equipped with a blue diagnostic connecter, placed on the distribution plate, near the fuses. The cable harness adapter (refer to 4.2.2) shall be connected to this connector in order to establish a connection to the internal CAN-Bus.





5 Installation instructions

Exit all running programs and applications.

To install the diagnostic tool start the VDT_Setup.exe file

📸 VDT_Setup.exe

-

After the welcome window has been opened, read the general installation information, accept the license terms and conditions and click the INSTALL button

👑 Valeo Diagnostic Tool Setup	_		×
Valeo Diagnostic Tool			
Valoo Diagnostic Tool license terms			
valeo Diagnostic 1001 <u>incense terris</u> .			
I agree to the license	terms an	d conditi	ons
In	stall	Clos	se

Please wait until the installation is completed.

👹 Valeo Diagnostic Tool Setup	_		×
Valeo Diagnostic Tool			
Setup Progress			
Processing: Valeo Diagnostic Tool			
		Can	cel



When the installation is completed, the window "Installation Complete" appears. Click on the CLOSE button to finish the installation

👹 Valeo Diagnostic Tool Setup		\times
Valeo Diagnostic Tool		
5		
Installation Successfully Completed		
	Clo	se



6 Operating instructions

After the installation is completed, a shortcut is created on the desktop.



6.1 Program structure

Starting the program will launch the main window.

The window consists of three (3) areas:

- Workspace
- Menu bar
- Status bar

💹 Diagnostic Tester 0.0.5-ALPHA (0.0.5.4)		- 🗆 ×
E Diagnostic Tester 0.0.5-ALPHA (0.0.5.4)	Valeo Diagnostic Tool	- • ×
Menu bar	Connect	
Status: CAN-bus connection:	Status bar	: Standard
System detected:		



6.1.1 Workspace

In the workspace area, the user will be able to interact with the connected ECU as follows:

- To read ECU and system data
- To control system functionality
- To update ECU software

At program start-up, depended on the user access rights (refer to 6.3), only a **CONNECT** button and **UPDATE FIRMWARE** button will be accessible to the user.



6.1.2 Menu bar

The Menu bar can be accessed through the "Triple Bar" icon (≡) placed in the top left corner.



Via the Menu bar, the user can access following features:

- System Information for showing ECU ID numbers (SAP, etc.) → refer to Chapter 6.2.1
- System Monitoring for reading component information from the CAN-Bus → refer to Chapter 6.2.2
- System EOL for controlling of components and auxiliary modes → refer to Chapter 6.2.3
- System Update for updating the ECU software → refer to Chapter 6.2.4

≡
Menu
System Information
System Monitoring
System EOL
System Update

Based on the user access right (refer to 6.3), one or more features might not be accessible to the user

At program start-up, the menu bar will be empty. Only after evaluating the access rights and connecting to the ECU, the features, listed above, will appear and be accessible to the user



6.1.3 Status bar

In the status bar the user can see following information:

• CAN-Bus Connection → indicates if the PEAK-CAN dongle is connected and detected



• System detected → indicates if a known ECU is detected



Edition → shows the user access right

 Standard

Edition: Standard

o Extended

Edition: Extended



6.2 **Program operation**

6.2.1 Connecting to system

By clicking the **CONNECT** button in the workspace area, the user will establish a connection to the ECU of the system.



After a successful connection has been established:

- The status of the connection will be shown in the status bar
- The feature "System Information" will be selected automatically in the Menu bar
- All relevant SAP-IDs of the ECU will be shown in the workspace area

System Information	Valeo Diagnostic Tool	- • × Valeo
	SAP number electronic 011146964 SAP number bootloader 011146970 SAP number base-sw 011146973 SAP number application 011147243 SAP number dataset 011147243	1A DA 38 38 38
Status: CAN-bus connection: O System detected:		Edition: Standard Disconnect



6.2.2 Reading system data

To read the system data, open the Menu bar and select the "System Monitoring" feature.

≡
Menu
System Information
System Monitoring
System EOL
System Update

In the workspace area, the relevant system data will be shown under the TAB "System Status"

🕮 Diagnostic Tester 0.0.5-ALPHA (0.0.5.4)			- 🗆 ×
System Monitoring	Valeo Diagnost	ic Tool	Valeo
System Status Failures			
Actuators	Actuators	Refrigerant Temperatures	
SetPointAxialFans_1 (%)	SLHP_RS	T_ihxR (deg C) 23	
SetPointAxialFans_2 (%) 0	Position_MC (Steps) 288	T_ohxR (deg C) 23	
SetPointRadialBlowers_1 (%) 0	Position_FB (Steps) 288	T_mceR2 (deg C) 23	
SetPointCompressor1 (%) 0	bPrechargingBypass 0	T_compR1 (deg C) 24	
FreshAirFlaps1 (%)		T_compR2 (deg C) 24	
FreshAirFlaps2 (%)	System Status	Air temperatures	
WaterValve1 (%) Roof	ActualClimateMode Ventilation	T ibyA1 Tice (dep C) 23	
WaterValve2 (%) Open	Second Manager (PDM)	T_hu42(dec() 22	
StatusSwitchingValve Cooling	Speed_measured (RPM)	I_INXA2 (deg C)	
StatusBypassValve Off	Voltages	System Pressure	
SetPointEEV_MC (%) 60	VoltageOnTheAxialFans (V) 26	P_compR1 (bara) 53	
SetPointEEV_FB (%) 60	DC_Link_Current (A) 0	P_compR2 (bara) 53	
OilSumpHeater Off	DC_Link_Voltage (V) 15		
Status:		Editi	on: Extended
CAN-bus connection: 🔘		D	sconnect
System detected:			

Similar values and components are pre-divided into groups:

- Actuators: Blowers, Fans, Valves
- Refrigerant temperatures: Sensors measuring the refrigerant temperature
- Air temperatures: Sensors measuring the air temperature



- Voltages
- System status
- System pressure

To access all active failures in the system click on the TAB "Failures"

Diagn	ostic Tester 0.0.5-ALPHA (0.0.5.0)	Valeo Diagnostic Tool	
System 3	Status Failures		
Errorl	D Error Description	HVAC Reaction	Action/Remedy or fault tracing
11	HVIL error	The HVAC can only work on Ventilation	check HVIL connection
252			

The failures are displayed in tabular form including information regarding the:

- Error ID
- Error Description
- HVAC Reaction
- Action / Remedy or fault tracing



6.2.3 Component and system control

To control the components in the system from the tool, open the Menu bar and select the "System EOL" feature

≡
Menu
System Information
System Monitoring
System EOL
System Update

A dialog for confirmation will appear on the screen.



! After selecting the OK button, the complete system will go automatically into IDLE state and wait for commands from the tool.!



In the workspace area, the relevant controls will be shown under the TAB "EOL"

💹 Diagnostic Tester 0.0.5-ALPHA (0.0.5.4)			- 🗆 X
System EOL	Valeo Diag	nostic Tool	Valeo
EOL Failures			
Fans/ Blowers	Valves	Sensors	Auxiliary Modes
AxFan_RTU_9_10_11	Refrigerant_Viv	PR_LS (bara) 53	MaxCooling Off
Axfan_RTU_18	RefrigerantFb_Vlv	PR_HS (bara) 53	MaxHeating Off
0	60	TR_IHX (gradC) 23	GasCharging Off
RadBlw1_RTU	Voltages	TR_OHX (gradC) 23	CoolantFilling Off
Values	EV_CL15 (V) 26	TA_PC (gradC) 23	Compr_Speed (rpm) 0
Switching_VIv Cooling	EV_CL30 (V) 26	TA_Duct (gradC) 24	
Deicing_Vlv Off	EV_HVIL_Curr (mA) 22	TR_LS (gradC) 24	
BypassWaterValve Open	Compr_Voltage (V) 15	TR_FbeR2 (gradC) 23	
RTU_Water_Valve Roof	Compr_Current (A) 0	TR_HS (gradC) 24	
Flap_Left_RTU Recirc			
Flap_Right_RTU Recirc			
Status: Edition: Extended			
CAN-bus connection:			Disconnect
System detected:			

Similar components and system functions are pre-divided into groups:

- Fans/Blower: Control the speed of the Blowers and Fans
- Valves: Control the position of the valves
- Sensors: Reading the sensor values
- Voltages: Reading the voltages
- Auxiliary Modes: Control the system mode

To access all active failures in the system click on the TAB "Failures"

Diagnostic Tester 0.0.5-ALPHA (0.0.5.3) System EOL	Valeo Diagnostic Too	pl
EOL Failures ErrorID Error Description	HVAC Reaction	Action/Remedy or fault traci
252		



6.2.4 System Update

To update the ECU software, open the Menu bar and select the "System Update" feature.

≡
Menu
System Information
System Monitoring
System EOL
System Update

To update the software of the ECU, the user first has to select the button below "File name"

💹 Diagnostic Tester 0.0.5-ALPHA (0.0.5.4)		– 🗆 X
E System Update	Valeo Diagnostic Tool	Valeo
Filename: Update Inf Base Soft Applicati Dataset	armation: Start Update Cancel ware State: >n State: State:	
Status: CAN-bus connection:	Edit	tion: Extended Disconnect



A windows menu will appear, allowing the user to navigate to the desired folder containing the necessary software files

Organize 👻 New folde	f		III 🕶 🔲	8
vdtlogs ^	Name	Date modified	Туре	Size
vdttraces	ApplSW.hex	1/26/2023 4:01 PM	HEX File	
🗸 🛄 This PC	BaseSW.hex	1/26/2023 3:55 PM	HEX File	
> 🧊 3D Objects				
> Desktop				
> 🗎 Documents				
> 🕂 Downloads				
> 🁌 Music				
> E Pictures				
> 🚼 Videos				
> 🏪 WINDOWS (C:)				
> 🛫 public\$ (\\gil1-s				
> 🛖 project\$ (\\gil1-:				
> 🛫 groups\$ (\\gil1-: 🗸	٢			>
File na	ame:	~ Hex-Files	(*.hex)	~
		Oper	Cancel	

After selecting the desired file, the name of the file will appear inside the name bar and the "**Start Update**" button will become active, allowing the user to initiate the update process

💹 Diagnostic Tester 0.0.5-ALPHA	(0.0.5.4)	– 🗆 ×
E System Update	Valeo Diagnostic Tool	Valeo
	Filename:	



The progress of the update process will be indicated by the respective bar

🖳 Diagnostic Tester 0.0.5-ALPHA ((0.0.5.4)	– 🗆 ×
E System Update	Valeo Diagnostic Tool	Valeo
	Filename:	
	Update Information: Start Update Cancel	
	Base Software State:	
	Application State: TransmitUpdate 43	
	Dataset State:	

After the update process is finished the progress bar should indicate 100% and no errors shall appear

🖳 Diagnostic Tester 0.0.5-ALPHA	(0.0.5.4)	– 🗆 X
E System Update	Valeo Diagnostic Tool	Valeo
	Filename	
	ApplSW.hex	
	Update Information: Start Update Cancel	
	Base Software State:	
	Application State: UpdateDone	
	100	
	Dataset State: UpdateDone 100	



In case that the software files, are not compatible to each other, an error will appear after the updating process, indicating that the "**Firmware is not valid and not matching**"

🔙 Diagnostic Tester 0.0.5-ALPHA (0.0.5.4)	- 🗆 X
E System Update	Valeo Diagnostic Tool	Valeo
	Filename: ApplSW-wrong.hex Update Information: Start Update Cancel Error: Update not successful (FinalizeUpdate) Base Software State:	
	Application State: UpdateDone 100 FW Valid: FW Matching: HW Matching: Dataset State. pdateDone 100 100 HW Matching: 100 HW Matching: 100 HW Matching: 100 100	

In this case, the update process has to be started again with the correct software file. The tool will disconnect from the ECU.



6.3 User access rights

There are currently two (2) different access levels of the tool, defined as:

- Standard Edition
 - The user shall get access to following features:
 - Read the general ECU information
 - Read the actual status of the component
 - Read all active failures
 - Extended Edition
 - The functionality shall include the scope of Standard Edition
 - The user shall get also access to advanced features like:
 - Control the state of all low voltage components
 - Trigger auxiliary routines
 - Update ECU software version

In order to differentiate between the Editions, a physical Dongle shall be used.

The Extended Edition shall be only accessible when the physical dongle is connected.

