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Hardware Configuration

The hardware configuration for BMW diagnosis is as shown in Figure 01.

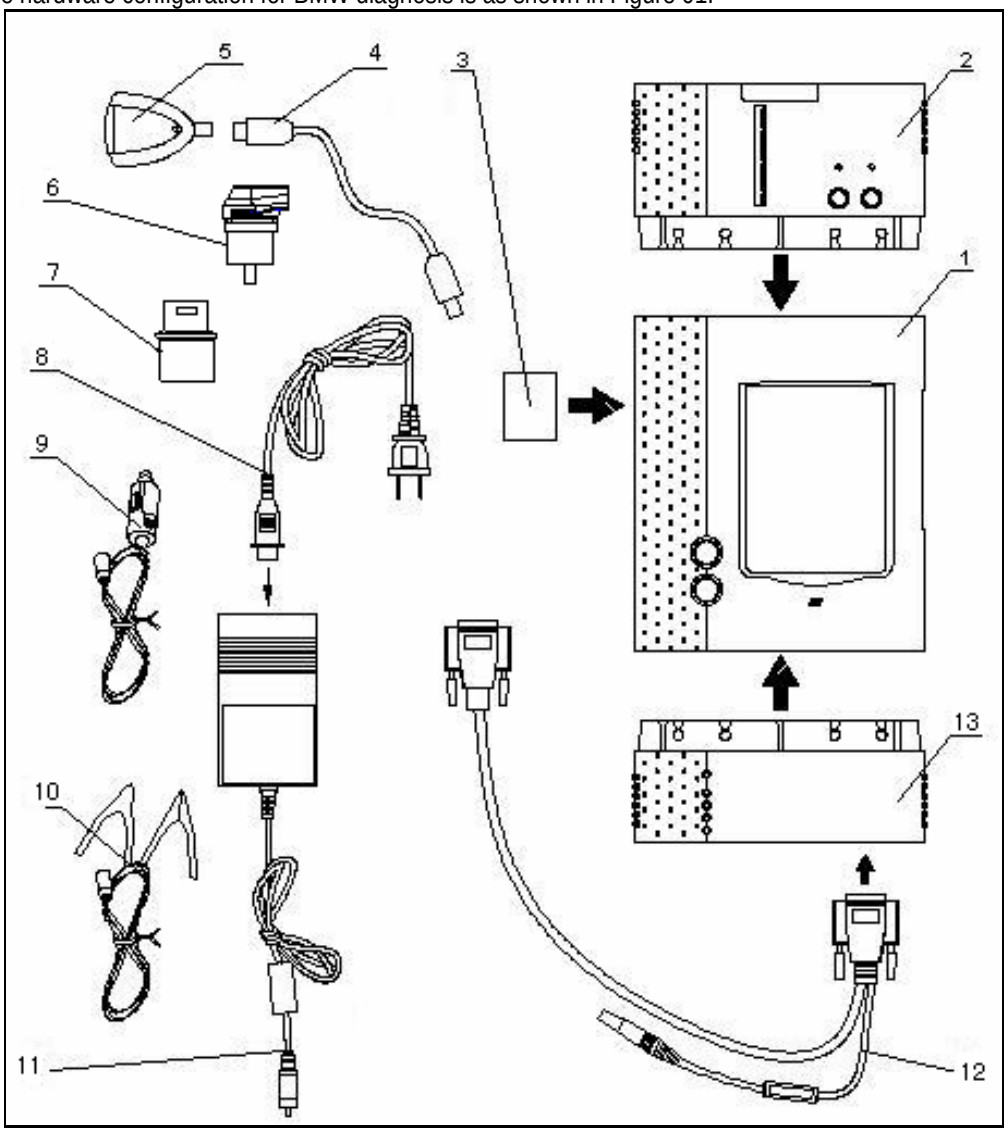

Figure 01

Configuration for BMW diagnosis (Figure 01):

Item	Name	Descriptions	Item	Name	Descriptions
1	X-431 main unit	To display operation buttons, test result, help information, etc.	8	Power cord	To connect the AC 100-240V outlet and the power adapter.
2	MINIPRINTER	To print test result. (optional)	9	Cigarette lighter cable	To get power from the vehicle cigarette lighter
3	CF cartridge	To store diagnostic software and data	10	Battery cable w/two clips	To get power from the vehicle battery
4	USB cable	To connect CF card reader/writer and computer	11	Power adapter	To convert 100-240V AC power into 12V DC power.
5	CF card reader/writer	To read or write data on the CF card	12	Main cable	To connect the diagnostic connector and SMARTBOX
6	[BMW-20] connector	To diagnose BMW vehicles with 20PIN diagnostic socket	13	SMARTBOX	To perform vehicle diagnosis
7	[BMW-16] connector	To diagnose vehicles with BMW-16PIN diagnostic socket			

Ports and Indicators

See Figure 02 for X-431 connection ports and indicators.

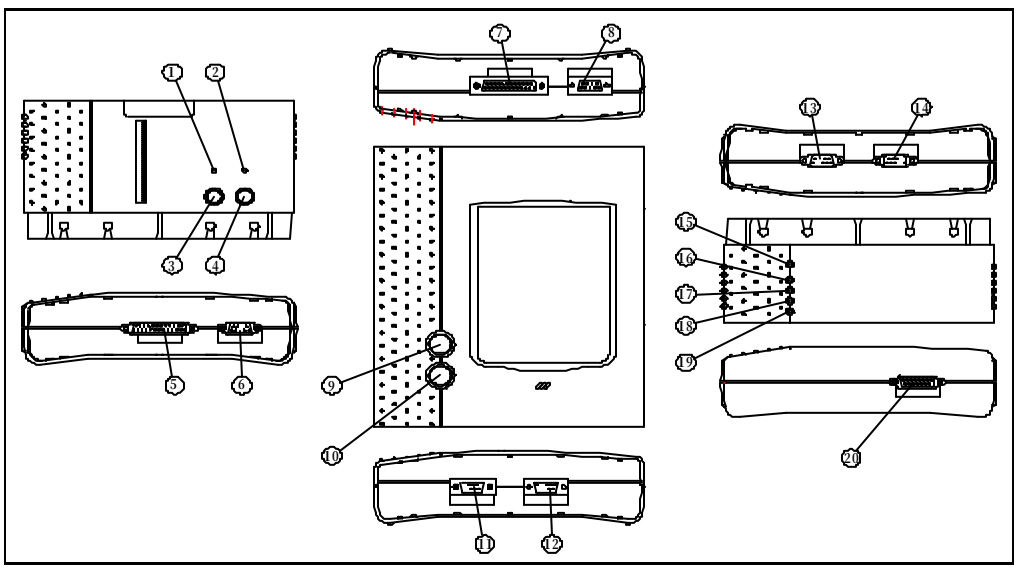

Figure 02

1	Printer SEL indicator（printer readiness）
2	Printer power indicator
3	Printer SEL button （printer readiness）
4	Printer FL button （paper feed）
5	Parallel port of printer for communication with main unit
6	Power input for printer
7	Parallel port of main unit for communication with printer
8	Power output of main unit.
9	Hotkey of main unit
10	Power switch of main unit.
11	Power input of main unit
12	Serial communication port of main unit
13	Power output of SMARTBOX
14	Serial communication port of SMARTBOX
15	SMARTBOX power indicator
16	Indicator to show SMARTBOX sending data to the main unit
17	Indicator to show SMARTBOX receiving data from the main unit
18	Indicator to show SMARTBOX sending data to ECU
19	Indicator to show SMARTBOX receiving data from ECU
20	SMARTBOX data port

Printer Operation

Mounting Paper

MINIPRINTER uses heat sensitive paper with size of Φ30×57mm (internal hole Φ7mm). Refer to Figure 03a to Figure 03d for mounting the paper.

1. Open the paper lid on the back of the printer. See Figure 03a.

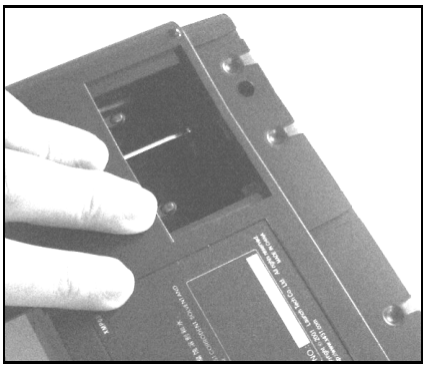

Figure 03a

2. Take out the spindle and mount the paper scroll onto the spindle. See Figure 03b.

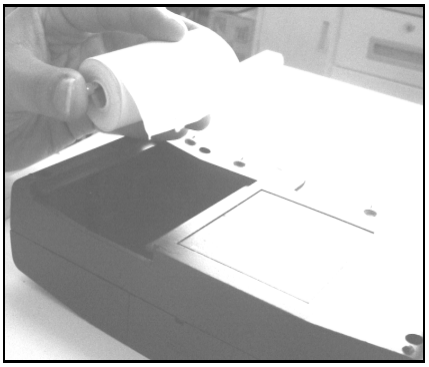

Figure 03b

3. Put the paper spindle into the printer with correct direction. The paper may not be fed if the direction is wrong. See Figure 03b and Figure 03c.

Figure 03c

4. Open the side plate, pull up the pressing rod and lead the paper into slot. Turn the feed knob clockwise until the paper comes

out of the outlet. See Figure 03d.

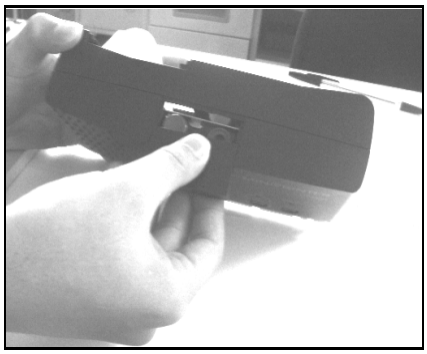

Figure 03d

5. Push down the pressing rod, mount the side plate, attach the paper lid, and then connect the printer to the X-431 main unit.

Printing Test Result

There are two indicators on the printer:

1. [SEL] :to show the readiness of the printer.
2. [POWER] : the power indicator of the printer.

If the [SEL] indicator is not lit, you can press the [SEL] button to turn it on and make the printer ready.

When the [SEL] indicator is lit, it shows that the printer is ready. Click the [PRINT] button (if it appears) on the screen of X-431 main unit to print the test result.

Explanation of Buttons

[POWER]	Power button
[HOTKEY]	Hot key. Press it to directly enter the vehicle diagnosis interface after X-431 is started.
[SEL]	To select the printer. When [SEL] indicator is lit, the printer is ready to print. If [SEL] indicator is not lit, the printer is unable to print.
[FL]	Paper-feed button.

Button Descriptions

The main buttons on the operation interface and their functions are as follows:
[**BACK**]: to return to the previous interface.
[**START**]: to do the next operation.
[**EXIT**]: to exit the diagnostic program.
[**OK**]: to confirm and execute.
[**CANCEL**]: to cancel present operation and return to the previous interface.
[**PAGE UP**]: to display the previous page. It is inactive if the current page is the first page.
[**PAGE DOWN**]: to display the next page. It is inactive if the current page is the last page.
[**HOME**]: return to the main interface.
[**PRINT**]: to print the test result.
[**BOX INFO**]: to show the version information of SMARTBOX.
[**HELP**]: to display the help information.
[**RETRY**]: to do the unfinished operation once again.

Conditions for Test

- The voltage of vehicle battery should be 11-14V. The rated voltage of the X-431 is 12V.
- Turn off all electric devices such as A/C, headlight, stereos etc.
- The throttle should be in the closed position.
- The ignition timer and idle speed should be in the standard range; the water temperature should be 90-110℃ and the transmission oil temperature should be 50-80℃.

BMW Diagnostic Socket

BMW-20PIN Diagnostic Socket

Location of the diagnostic socket

1. For the BMW vehicle of year 80-90, the diagnostic socket is at the right side in the engine compartment.
2. The diagnostic socket for 525i and 535i is at the left or right side in the engine compartment, as shown in Figure 04.
3. The diagnostic socket for 325, 635i and 735i is located in the cab under the instrument.

Figure 04

The BMW-20PIN diagnostic socket is as shown in Figure 05.

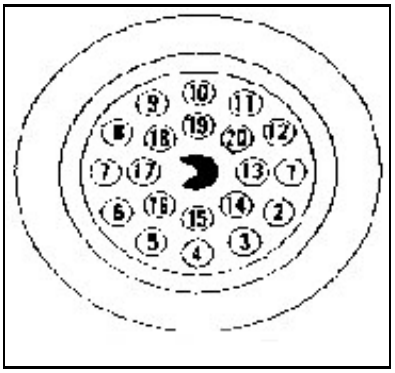

Figure 05

See the following table for PIN definition of BMW-20PIN diagnostic socket:

PIN	Definition
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	Service reset
8	Not used
9	Not used
10	Not used
11	Starting signal
12	Alternator （D+） control
13	Not used
14	Permanent power supply
15	Diagnostic information line （RxD）
16	Ignition operation （15） and starting
17	Diagnostic information line
18	Input line for DME、ECU software modification.
19	Body ground
20	Diagnostic information （TxD）

BMW-16PIN Diagnostic Socket

BMW-16PIN diagnostic socket is located in the cab under the instrument at the left side. See Figure 06 for its outline.

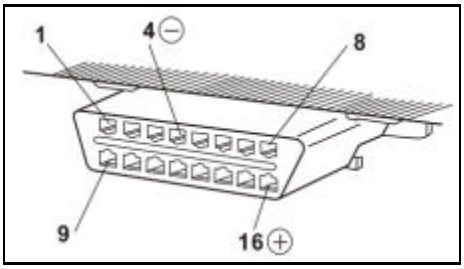

Figure 06

See the following table for PIN definition of BMW-16PIN diagnostic socket:

PIN	Definition
1	Not used
2	J1850 BUS+
3	Not used
4	Body ground
5	Signal ground
6	Not used
7	ISO9141 K line
8	Not used
9	Not used
10	J1850 BUS-
11	Not used
12	Not used
13	Not used
14	Not used
15	ISO9141 L line
16	Battery voltage

Select Diagnostic connector

- Select [BMW-20] diagnostic connector for the vehicle with 20PIN diagnostic socket.
- Select [BMW-16] diagnostic connector for the vehicle with 16PIN diagnostic socket.

Connection

BMW-20PIN Diagnostic Socket

- Insert the CF cartridge into the CF cartridge slot, let the side printed with "X-431" be downward, and make sure the cartridge is fully seated.
- Insert one end of the main cable into the data port on SMARTBOX.
- Connect the other end of the main cable to the [BMW-20] diagnostic.
- Plug the other end of the diagnostic connector into the BMW-20PIN diagnostic socket.

BMW-16PIN Diagnostic Socket

Refer to Figure 07 for 16PIN diagnostic socket connection:

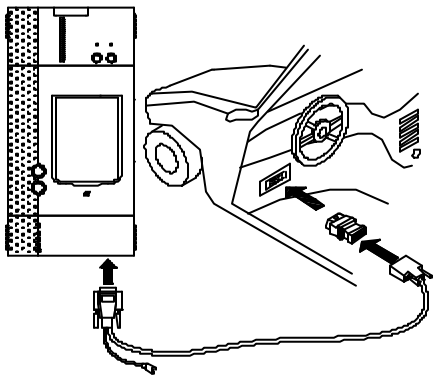

Figure 07

- Insert the CF cartridge into the CF cartridge slot, let the side printed with "X-431" be downward, and make sure the cartridge is fully seated.
- Insert one end of the main cable into the diagnostic socket on SMARTBOX.
- Connect the other end of the main cable to the [BMW-16] diagnostic connector.
- Plug the other end of the diagnostic connector into the BMW-16PIN diagnostic socket.

Note:
If the power supply on vehicle diagnostic socket is insufficient or the power pin is damaged, you can get power in the following ways:

- ***From cigarette lighter: insert one end of the cigarette lighter cable into the lighter socket in vehicle and connect the other end to the power connector of X-431 main cable.***
- ***From battery: clamp the two clips of battery cable on the positive and negative poles of battery and insert another end of the cable into the power connector of X-431 main cable.***
- ***From power adapter: connect the power adapter to the 100-240V AC outlet with power cord. Insert the 12V DC plug of power adapter into the power connector of X-431 main cable***