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China Passenger Car Cockpit Multi and Dual Display Research Report, 2022

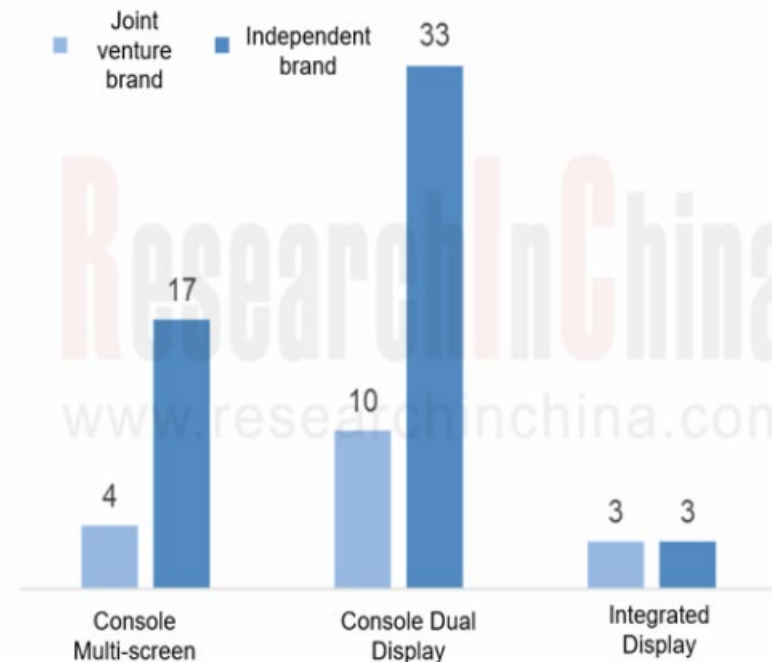
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Cockpit multi and dual display research: 51.5% year-on-year growth in center console multi and dual display installation from January to July 2022

ResearchInChina released "China Passenger Car Cockpit Multi and Dual Display Research Report, 2022", which compares and summarizes the current domestic cockpit multi and dual display solutions in terms of R&D layout, product implementation, etc.

With the cockpit domain control, software technology maturity and Qualcomm 8155 and other large computing chip is widely used, auto companies and suppliers are no longer stuck in the conventional cockpit display layout, and continue to push the new, landing multi/dual and even integrated display solution, application cases of one-chip, multi-display and single-system also began to increase, supporting the intelligent upgrade of the cockpit.

Installation Brands of Console Multi-screen / Dual / Integrated Display for China Passenger Car, Jan.-Jul. 2022



Source: ResearchInChina

Further growth in sales of vehicle models with multi and dual display in 2022

ResearchInChina monitors that the number of auto brands landing multi and dual display solutions in 2022 has further expanded. 21 brands are equipped with multi and dual display solutions, 43 brands are equipped with dual display solutions and 6 brands are equipped with integrated-display solutions in China passenger car market (excluding imported models) on sale from January to July 2022.

With more vehicle models joining the multi and dual display camp, the installation volume of console multi-screen / dual display still achieved positive growth despite the negative growth of the whole vehicle sales. 276,000 units of console multi-screen models were sold from January to July 2022, up 51.5% year-on-year, and 1,059,000 units of console dual display models were sold, up 17.5% year-on-year. From the composition of the solution, the console two-screen and console dual display currently is still the main force, and the growth rate is obvious.

42 auto companies have equipped with dual display solutions

From the implementation, the earliest application of dual display solution is Mercedes-Benz E-Class, which was launched in August 2016, and since then Mercedes-Benz has gradually introduced the dual display solution into A-Class/GLA/GLB/EQA/EQB/EQC and other models. In the past 6 years, a total of 42 auto companies have joined the console dual display camp, such as Haval, MG, Roewe, BMW, Volkswagen, Kia, etc.

Sales Volume and Growth Rate of Console Multi-screen / Dual Display Vehicle Models, 2021-Jul. 2022

Display Solution	2021		Jan.-Jul. 2022	
	Sales Volume/10,000 units	YoY	Sales Volume/10,000 units	YoY
Console multi-screen display	35.4	35.7%	27.6%	51.5%
- Console two-screen	26.1	14.5%	20.4%	44.2%
- Console three-screen	9.4	179.9%	7.2%	77.1%
Console dual display	168.7	73.2%	105.9%	17.5%
- Console dual-display	158.5	68.5%	97.8%	13.8%
- Console triple-display	10.2	202.9%	8.1%	92.8%

Source: ResearchInChina

Typical model of dual display: Haval Shenshou

In December 2021, Haval Shenshou, the brand's first dual display model, was launched with Continental's V-shaped dual display solution (12.3-inch instrument cluster, 14.6-inch center console, 1920×720 resolution), covered by a shaped glass. In the solution, the console screen is slightly tilted to the driver's side, which can precisely match the driver's line of sight. In terms of chip-display-OS, Haval Shenshou is equipped with a Qualcomm 8155 chip running QNX and Android dual system, which provides computing power for LCD dashboard and console screen.



Typical model of dual-display: BMW 3 Series

A few months after BMW officially unveiled its world's first dual screen display solution model, BMW iX, BMW Brilliance followed suit, and 2022 BMW Brilliance i3 and 3 Series were launched with dual screen display solutions. BMW Brilliance i3 and 3 Series are equipped with the same integrated floating curved screen of BMW iX (12.3-inch instrument cluster, 14.9-inch center console, 200 PPI), which is suspended through bracket and tilted towards driver at a 6 ° inclination angle. As a long-term partner of Intel, BMW Brilliance 3 Series is equipped with an Intel Atom X7-3960 chip based on Apollo Lake platform, which runs a Linux system in LCD meter and console display. In the future, BMW Brilliance plans to introduce dual display solution to more models, including X1 and X3.



Typical model of triple-display: Rising Auto R7

Rising Auto, as a high-end new energy brand of SAIC Group, applies the triple-screen display solution for the first time in Rising Auto R7. The solution adopts integrated packaging technology, by using AGC Dragontrail glass integrated coverage, the full lamination design completely eliminates the gap between glass and OLED screen. The size of the triple-screen display is 10.25-inch instrument cluster, 15.05-inch console screen and 12.3-inch co-pilot entertainment screen, with a total size of 43 inches. In terms of chip-display-OS, RISING OS and UI are developed and designed by SAIC Z-one Tech, equipped with Qualcomm Snapdragon SA8155 chip, based on the mainstream virtualization technology and RTOS + Android AOSP operating system in automotive field, and equipped with many platform modules required for cloud-pipe-end integrated SOA software architecture.



Integrated display landing on a small scale

Screen as the most important human-machine interaction information display window in the intelligent cockpit, its size also represents a certain degree of intelligence. In addition to increasing the number of screens, the ultra-wide integrated screen has become the choice of some OEMs, including conventional OEMs and emerging automakers. Integrated display can integrate multiple screens such as instrument, center console and co-pilot entertainment, and completely eliminate the physical interval of the ultra-wide screen to further enhance the cockpit technology. Currently, China passenger car market has a total of six brands (Ford, Lincoln, Cadillac, ARCFOX, IM, Roewe) to launch integrated-display models, but the sales are still in the small-scale. From 2021 to July 2022, integrated-display model sales were only 39,000 vehicles.

**Sales Volume and Growth Rate of Console Integrated Display Vehicle Models,
2021-Jul. 2022**

Display Solution	2021		Jan.-Jul. 2022	
	Sales Volume/10,000 units	YoY	Sales Volume/10,000 units	YoY
Console integrated-screen display	0.6	-	3.3	433.5%
- Console instrument	-	-	0.1	-
- Console co-pilot	0.6	-	3.2	3358.7%

Source: ResearchInChina

Integrated-display typical model: Ford EVOS

The current USA brands in cockpit display solution is more radical, Ford, Lincoln, Cadillac all have launched integrated display, Ford as a representative brand, its EVOS, Mondeo, Explorer are equipped with 27-inch "center console + co-pilot entertainment" integrated display on sale. Take Ford EVOS as an example, it is equipped with a 27-inch center console + co-pilot integrated screen with a resolution of 4032×756, forming a dual-screen solution with LCD dashboard. The total length of the dual-screen display is 1.1m, running through the entire center console. As for the IVI, it is equipped with a Desay SV domain controller with a built-in NXP i.MX8M and a Qualcomm 820A chip, which provide computing power for LCD dashboard (QNX) and the center console co-pilot (Android) respectively.



Integrated- display typical model: IM L7

As the high-end brand of SAIC, IM pursues unconventional cockpit display solutions. The front row of the IM L7 cockpit is equipped with 3 screens, of which the 26.3-inch "instrument center console" integrated display and the 12.3-inch co-pilot entertainment screen support independent lifting. Among them, the resolution of the instrument center console integrated screen reaches 4320 × 720, and the maximum brightness is 1000nit. The entire cockpit system provides information display for the three screens of instrument/center console, co-pilot entertainment and function control through a Qualcomm 8155 chip and a set of Banma AliOS.

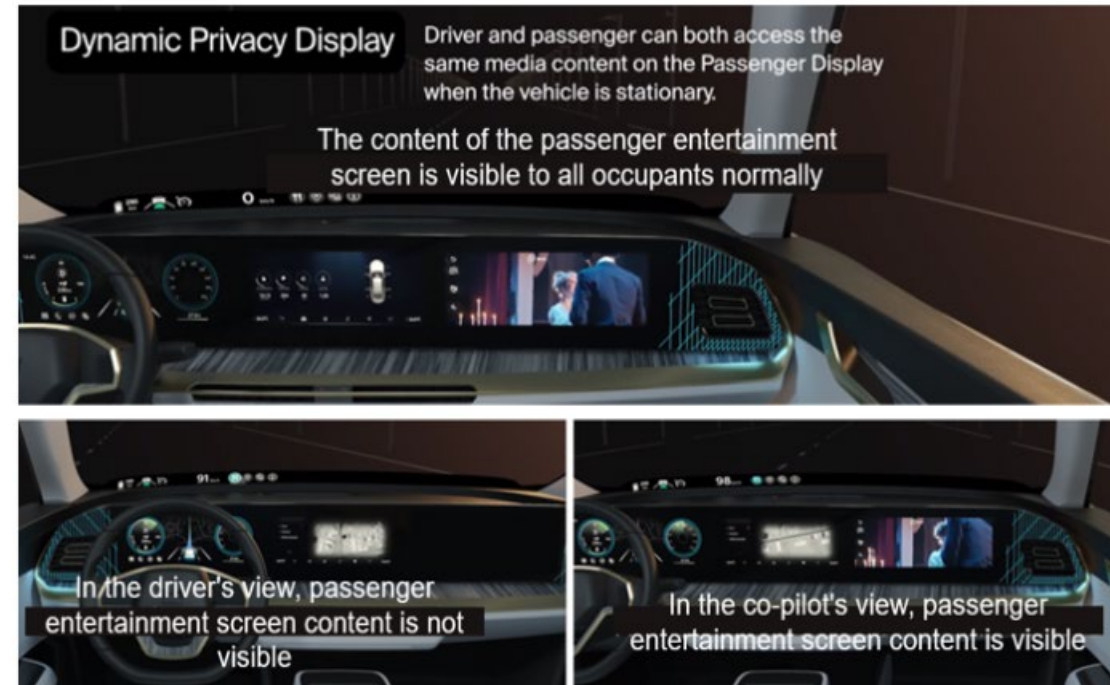


Future dynamic privacy display is expected to be applied to the co-pilot screen to help driving safety

The increase in the number of screens in the front of cockpit will undoubtedly bring hidden problems such as light interference and distraction for the driver. To ensure driving safety, Continental, Visteon and Marelli have been planning and laying out the co-pilot entertainment display with privacy technology. The main principle is through the backlight technology, in different perspectives of the screen can provide different information display.

For example, Marelli's switchable dynamic privacy technology solution is based on intelligent backlight architecture to dynamically control the viewing angle of the co-pilot display, and switch between the two viewing angles at will. In privacy mode, by reducing the brightness and contrast of the screen in the driver's view, the driver cannot see the content of the passenger display, while the passenger can use the passenger entertainment screen normally. In the sunlight reflection and night environment, the driver can achieve safe driving without interference and share the content with the front passenger while ensuring safety.

Marelli Dynamic Privacy Display Mode



Source: Marelli

Console multi-screen display: split or expand functions in conventional center console screen, and set co-pilot entertainment screen and function control screen to the right and below the center console screen. Combination form: center console + co-pilot; center console + function control; center control + co-pilot + function control and other multi-screen display.

Console dual display: in conventional layout solution, there is a certain physical distance between LCD dashboard and center console screen, and a strong sense of visual division. By rearranging the LCD dashboard, center console screen, co-pilot entertainment screen and other screens covered by a glass, visually create a screen integration, one black technology, greatly weaken the sense of physical division between display. Combination form: instrument + center console; center console + co-pilot; instrument + center console + co-pilot entertainment and other dual display.

Integrated display: further upgraded in the form of console dual screen, the instrument, center console, co-pilot entertainment and other information is concentrated in an ultra-wide display screen, completely eliminating the physical interval. Combination form: instrument + center console; center console + co-pilot and other integrated display.

Table of Content (1)

1 Development Trends of Center Console Display for Intelligent Cockpit

- 1.1 Overview of Vehicle Center Console Display
- 1.2 Application Solutions of Vehicle Center Console Display: Multi-screen/Dual/Integrated Display
- 1.3 Relationships between Intelligent Cockpit Chip and Display
- 1.4 Industry Chain of Intelligent Cockpit Display
- 1.5 Cockpit Multi and Dual Display Solutions Drive Display Privacy Technology on Board
 - 1.5.1 Marelli Dynamic Privacy Technology
 - 1.5.2 Continental Smart Privacy Display, ShyTech Display

2 Status Quo of Console Multi-screen Display/Cockpit Dual Display Enabled Models Market

- 2.1 Passenger Car Brands Installed Console Display in China: Multi-screen/Dual/Integrated Display
 - 2.1.1 Installation Data of Console Display for China Passenger Car: Installation Volume and Installation Rate
 - 2.1.2 Solution Proportion of Console Display for China Passenger Car: Multi-screen/Dual/Integrated Display
- 2.2 Installation Data of Passenger Car Models with Console Display: Single-screen
 - 2.2.1 Installation Data of Passenger Car Models with Console Single-screen Display: Screen Size
 - 2.2.2 Sales Distribution of Passenger Car Models with Console Single-screen Display: by Brand
 - 2.2.3 Sales Distribution of Passenger Car Models with Console Single-screen Display: by Model

2.2.4 Sales Distribution of Passenger Car Models with Console Single-screen Display: by Price

2.3 Installation Data of Passenger Car Models with Console Display: Multi-screen Display

2.3.1 Installation Data of Passenger Car Models with Console Multi-screen Display: Screen Size

2.3.2 Sales Distribution of Passenger Car Models with Console Multi-screen Display: by Brand

2.3.3 Sales Distribution of Passenger Car Models with Console Multi-screen Display: by Model

2.3.4 Sales Distribution of Passenger Car Models with Console Multi-screen Display: by Price

2.4 Installation Data of Passenger Car Models with Console Display: Dual Display

2.4.1 Sales Distribution of Passenger Car Models with Console Dual Display: by Brand

2.4.2 Sales Distribution of Passenger Car Models with Console Dual Display: by Model

2.4.3 Sales Distribution of Passenger Car Models with Console Dual Display: by Price

2.5 Installation Data of Passenger Car Models with Console Integrated Display

2.5.1 Sales Distribution of Passenger Car Models with Console Integrated Display: by Brand/Model/Price

Table of Content (2)

3 OEMs' Layout of Cockpit Multi and Dual Display

3.1 Changan Auto

3.1.1 Installation Data of Multi and Dual Display

3.1.2 Typical Models of Multi and Dual Display

3.2 Great Wall Motor (HAVAL, ORA, TANK)

3.2.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.2.2 Typical Models of Multi and Dual Display

3.3 FAW (Hongqi, Besturn)

3.3.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.3.2 Typical Models of Multi and Dual Display

3.4 Geely (Geely, Geometry)

3.4.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.4.2 Typical Models of Multi and Dual Display

3.5 Chery (Chery, EXEED, JETOUR)

3.5.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.5.2 Typical Models of Multi and Dual Display

3.6 GAC Passenger Cars (Trumpchi, Aion)

3.6.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.6.2 Typical Models of Multi and Dual Display

3.7 SAIC Passenger Cars (MG, Roewe, IM, Rising, MAXUS)

3.7.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.7.2 Typical Models of Multi and Dual Display

3.8 BAIC (Beijing, ARCFOX)

3.8.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.8.2 Typical Models of Multi and Dual Display

3.9 Li Auto

3.9.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.9.2 Typical Models of Multi and Dual Display

3.10 XPeng Motor

3.10.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.10.2 Typical Models of Multi and Dual Display

3.11 Mercedes-Benz

3.11.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.11.2 Typical Models of Multi and Dual Display

3.12 GM (Buick, Cadillac, Wuling, Baojun)

3.12.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.12.2 Typical Models of Multi and Dual Display

3.13 Hyundai (Hyundai, Kia)

3.13.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.13.2 Typical Models of Multi and Dual Display

3.14 Ford (Changan Ford, Jiangling Ford, Lincoln)

3.14.1 Installation Data of Multi and Dual Display: Models/Sales Volume

3.14.2 Typical Models of Multi and Dual Display

Table of Content (3)

- 3.15 BMW
 - 3.15.1 Installation Data of Multi and Dual Display: Models/Sales Volume
 - 3.15.2 Typical Models of Multi and Dual Display
- 3.16 Multi and Dual Display / Integrated Display Typical Models: Chip-Display-OS Solution

4 Multi and Dual Display Solutions of Cockpit Tier 1 Suppliers

- 4.1 Harman
 - 4.1.1 Multi and Dual Display Solutions
 - 4.1.2 Reference Solutions of Multi/Dual Display Cockpit Deliverables
 - 4.1.3 Implementation of Multi and Dual Display Solutions
- 4.2 Visteon
 - 4.2.1 Chip-Display-OS Solution
 - 4.2.2 Multi / Dual Display and Domain Control Planning
 - 4.2.3 Implementation of Multi and Dual Display Solutions
- 4.3 Faurecia
 - 4.3.1 Multi and Dual Display Solutions
- 4.4 MARELLI
 - 4.4.1 Multi and Dual Display Solutions
 - 4.4.2 Integrated Large Display Solution
- 4.5 Aptiv
 - 4.5.1 Implementation of Multi and Dual Display Solutions

- 4.6 Bosch
 - 4.6.1 Multi and Dual Display Solutions
 - 4.6.2 R&D Multi and Dual Display Solutions
 - 4.6.3 Implementation of Multi and Dual Display Solutions
- 4.7 Continental
 - 4.7.1 Multi and Dual Display Solutions: Product Planning
 - 4.7.2 Multi and Dual Display Solutions
 - 4.7.3 Chip-Display-OS Solution
- 4.8 Denso
 - 4.8.1 Multi and Dual Display Solutions
 - 4.8.2 Multi and Dual Display Solutions: Development Planning
- 4.9 Panasonic
 - 4.9.1 Multi and Dual Display Solutions
- 4.10 Desay SV
 - 4.10.1 Multi and Dual Display Solutions
 - 4.10.2 Desay SV & BlackBerry Launched One-machine Dual-display Virtual Intelligent Cockpit Domain Controller
 - 4.10.3 ECU Ecosystem
 - 4.10.4 Implementation of Multi and Dual Display Solutions
- 4.11 Foryou
 - 4.11.1 Multi and Dual Display Solutions
 - 4.11.2 Multi and Dual Display Solutions: Dual Display: System Layout
 - 4.11.3 Implementation of Multi and Dual Display Solutions

Table of Content (4)

4.12 Neusoft

4.12.1 Multi and Dual Display Solutions

4.12.2 Multi and Dual Display Cockpit Platform Development Trend

4.12.3 Implementation of Multi and Dual Display Solutions

4.13 Joyson Electronics

4.13.1 Multi and Dual Display Solutions

4.14 NOBO Automotive Systems

4.14.1 Multi and Dual Display Solutions

4.14.2 Implementation of Multi and Dual Display Solutions

4.15 HASCO

4.15.1 Multi and Dual Display Solutions: One-chip, Single-display, Dual-system

4.16 Yanfeng

4.16.1 Multi and Dual Display Solutions

4.17 Huawei

4.17.1 Multi and Dual Display Solutions

4.17.2 Cockpit IVI System Solutions

4.18 Wuhan KOTEI Informatics

4.18.1 Multi and Dual Display Solutions

4.18.2 Multi and Dual Display Solutions: Layout



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