

**Global and China Automotive Instrument  
Cluster and Head-up Display (HUD)  
Industry Report, 2016-2020**

**May 2017**

## **STUDY GOAL AND OBJECTIVES**

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

## **REPORT OBJECTIVES**

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

## **METHODOLOGY**

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

## **INFORMATION SOURCES**

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

## Abstract

Global and China Automotive Instrument Cluster and Head-up Display (HUD) Industry Report, 2016-2020 highlights the following:

1. Global and China automobile market
2. Instrument cluster and HUD market and industry
3. Development trends of instrument cluster and HUD
4. DLP, laser scanning and AR HUDs
5. Key vendors

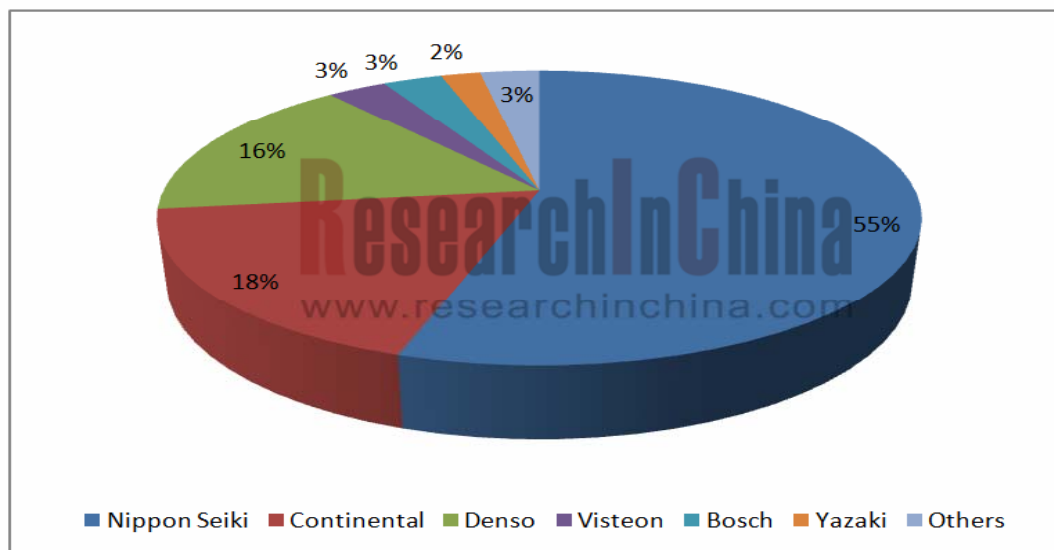
HUD (Head-up Display) falls into windshield type (W-type) and combined type (C-type). It was initially mounted on GM Corvette in 2001, and then the first color HUD was launched by BMW in 2004. Global OEM HUD market size attained USD560 million in 2016, surging by 33% from a year earlier, and is predicted to leap to USD1,780 million in 2020. Market size and shipments of W-type were roughly USD530 million and 2 million sets respectively in 2016, and will expectedly move up to USD1,715 million and about 7 million sets in 2020; C-type saw market size of around USD30 million and shipments of 600,000 sets in 2016, and the figures are estimated to climb to USD65 million and 1.7 million sets respectively in 2020.

Nippon Seiki under Honda seizes a market share of over 50%. BMW, GM and Audi are the three major clients of Nippon Seiki, and their models including BMW 5 Series, 7 Series, X Series, Audi Q7 and GM Cadillac and Buick all carry Nippon Seiki's HUDs. The company plans a capacity of 3 million units in 2020, most of which will be W-type. It now has 4 production bases in Japan, North America and the UK, and is building a new one in Miyoshi, Hiroshima Prefecture which is scheduled to come into production next year. Continental's main clients are Mercedes-Benz, Audi and BMW, and its HUDs find application in Mercedes-Benz C Class, Audi A6 and A7 and BMW 3 Series. In January 2017, Continental and the U.S.-based Digilens reached a strategic cooperation agreement for development of AR-HUD. Denso primarily supports Toyota and Hyundai; Visteon is a supplier of PSA; BMW Mini bears Bosch's HUD.

In OEM market, C-type will expectedly see a declining market share due to poor user experience, and even Chinese automakers use few HUDs of such type, for example, Geely equips its Borui models with W-type. AR-HUD is the general direction of OEM. To achieve AR (augmented reality) of the true sense, DLP (digital light processing) projection technology is indispensable. AR-HUD will come out in 2018 and be the mainstream in 2021. However, for digital micromirror device (DMD), the core component of DLP projector, and related technologies are monopolized by Texas Instruments, coupled with complicated optical path and much higher price of DMD than TFT-LCD, DLP's costs will seldom drop despite maturity of the technology for quite a few years. Therefore, laser scanning type HUD is likely to capture the market in the future, hopefully taking a share of 10% in OEM market in 2021, 25-30% in 2025.

As for aftermarket (AM), reflection-type TFT-LCD is dominant as DLP with more complicated optical path and higher internal temperature is unacceptable to AM manufacturers whose technology capabilities are relatively weak. With marked improvement in brightness of OLED, transparent OLED will be the development orientation of AM, but OLED for HUD will not appear in a short time because of little use in AM and monopoly of LG and Samsung in technology and capacity.

**Market Share of Major OEM HUD Vendors Worldwide, 2016**



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**1 Global and Chinese Automobile Markets**

Global Sales of Light Vehicles, 2010-2020E

Global Sales of Light Vehicles by Region, 2014-2017

Automobile Sales in China, 2005-2017

Overview of Chinese Automobile Market, 2016

**2 Automotive HUD and Instrument Cluster Market**

OEM Market Size of Automotive HUD, 2015-2021E

Automotive HUD Shipments, 2016-2021E

Aftermarket HUD Shipments Worldwide, 2016-2021E

Distribution of OEM HUD Types by Technology, 2016-2025E

Distribution of Aftermarket HUD Types by Technology, 2016-2025E

Market Share of Major OEM HUD Vendors in the World, 2016

Global Automotive Instrument Cluster Market Size, 2016-2022E

Market Share of Major Automotive Instrument Cluster Makers in the World, 2016

Market Distribution of World's Automotive Instrument Clusters by Type, 2016-2020E

Automotive Display Market

Market Share of World's Key TFT-LCD On-board Display Vendors (by Shipment), 2016

Market Share of World's Key TFT-LCD On-board Display Vendors (by Value), 2016

AMOLED On-board Display

**3 Profile of HUD**

HUD Falls into Windshield Type and Combined Type

Structure of W-type HUD

Light Path of W-type HUD

Structure of C-type HUD

Parameters of Typical C-type HUD

Cheapest HUD

HUD of Audi A7  
Anatomy of Audi A7 HUD  
Exceedingly High Technical Threshold  
Extreme Difficulty in Production

**4 DLP HUD**

HUD Basics -- VID  
Obvious Superiority of DLP Performance  
Problem about Resolution  
Interpupillary Distance (IPD)  
Comparison of HUD Technologies  
DLP is the Most Mature Technology with Best Performance Currently  
Light Path of DLP-Type HUD

**5 Laser Scanning HUD**


PicoP Laser Beam Scan Engine of Microvision  
MicroPicoP is Most Typical Laser Scanning  
Pocket Projector Celluon PicoPro  
Mitsubishi's and Pioneer's Laser Scanning HUDs Adopt the Patents of MicroVision  
Laser Scanning HUD of Intersil  
Laser Scanning HUD of Panasonic  
DLP HUD of Panasonic  
Jaguar's First Use of OEM Laser Scanning HUD  
Maxim's Laser Scanning HUD 8-channel DAC and Bridged SoC  
1st-generation Navdy DLP Hud is Priced at USD499  
Analysis of Navdy

**6 AR HUD**

HUD Trend – Perfect Fusion of AR (Augmented Reality) with ADAS  
Augmented Reality Head-Up Display  
Augmented Reality Head-Up Display ACC  
AR HUD (of Continental) to be Used on KIA K9  
AR HUD Requires Two to Three Display Layers  
Continental Adopts Double-Layer Display as well

**7 HUD and Instrument Cluster Vendors**

Profile of Visteon  
Quarterly Revenue and Gross Margin of Visteon for Successive 12 Quarters  
Revenue Breakdown of Visteon by Product, 2015-2016  
Revenue Breakdown of Visteon by Region/Customer, 2013-2016  
More Balanced Distribution of Visteon's Customers, 2017  
HUD Roadmap of Visteon  
HUD Orders of Visteon  
Profile of Nippon Seiki  
Revenue Breakdown of Nippon Seiki by Business, FY2013-FY2017  
Revenue Breakdown of Nippon SeikiE by Region, FY2014-FY2017  
Revenue Breakdown of Nippon Seiki by Customer, Q2/FY2016/2017  
Technology Roadmap of Nippon Seiki  
HUD Production Capacity of Nippon Seiki, FY2013-FY2021E  
Production Bases of Nippon Seiki  
Profile of Shanghai Nissei Display System Co., Ltd.  
HUD Subordinate to Instrumentation&Driver HMI Segment under Interior Business  
Global Footprints of Instrumentation & Driver HMI (ID)  
International Setup for HUDs



- Use Example of Continental's HUD
- Typical HUD Parameters of Continental
- Introduction to Pioneer SPX-HUD100
- Pioneer LaserScan HUD
- Bosch HUD for Mini
- Profile of Microvision
- Revenue Breakdown of Microvision by Business, 2013-2016
- Gross Margin of Microvision, Q1 2015 - Q3 2016
- Products Adopting Microvision's Patents



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