



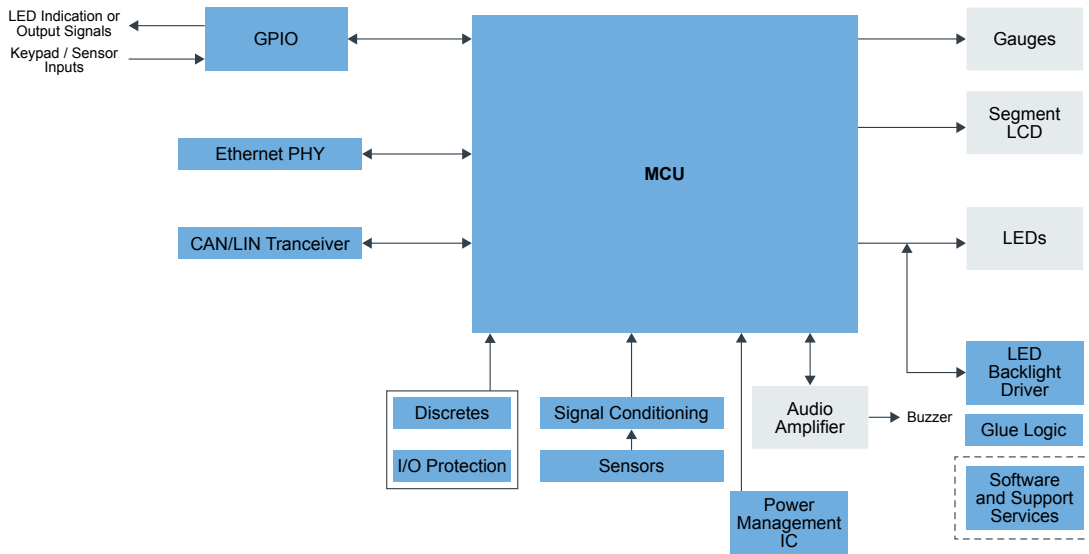
# Digital Cluster

Last Updated: Apr 19, 2024

In the on-demand world, vehicles need to be able to offer a stylized yet simple way to convey complex information to drivers. Instrument clusters need to offer high-resolution colour displays with realistic visual renderings.

NXP's portfolio of instrument clusters covers entry level cost-effective solutions, through 2D and 3D hybrid displays. Each solution combines a full suite of hardware and software tools, complemented by our extensive ecosystem development tools.

## Entry Instrument Cluster Block Diagram



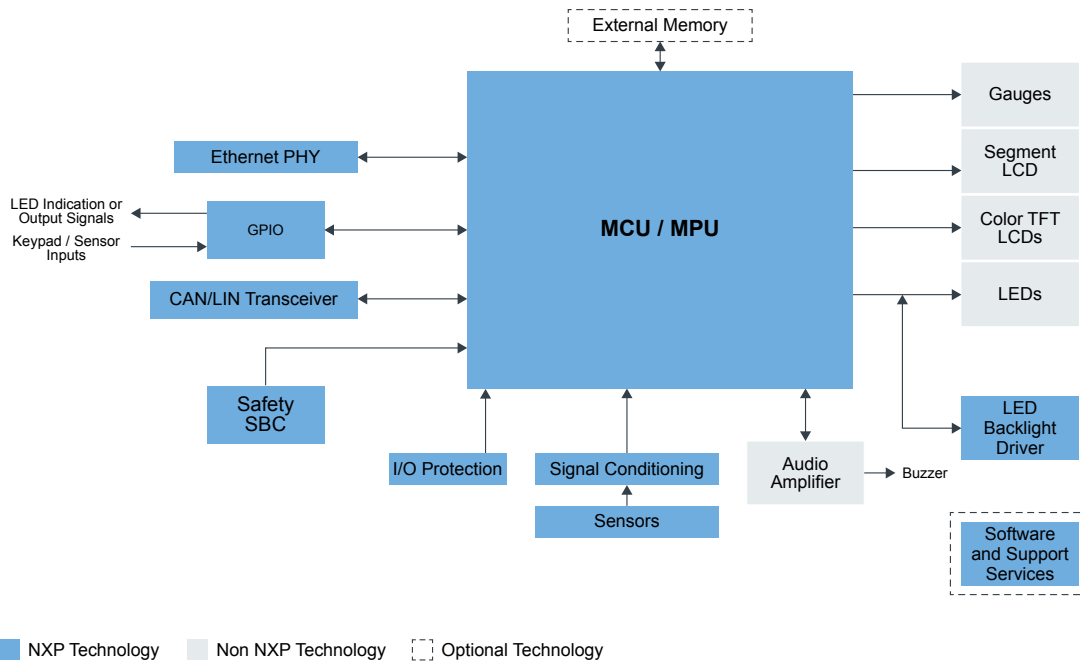
■ NXP Technology   
 ■ Non NXP Technology   
   Optional Technology

### Recommended Products for Entry Instrument Cluster

MCU	<ul style="list-style-type: none"> <li>• <a href="#">i.MX-RT1170</a>: i.MX RT1170: 1 GHz Crossover MCU with Arm® Cortex® Cores</li> <li>• <a href="#">MAC57D5xx</a>: Ultra-Reliable Multi-Core Arm®-Based MCU for Clusters and Display Management</li> <li>• <a href="#">MPC560xS</a>: Ultra-Reliable MPC560xS MCU for Automotive and Industrial Instrument Clusters</li> </ul>
Automotive Ethernet	<ul style="list-style-type: none"> <li>• <a href="#">TJA1120</a>: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver</li> <li>• <a href="#">TJA1103</a>: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver</li> <li>• <a href="#">TJA1101</a>: TJA1101B, IEEE 100BASE-T1 Compliant Automotive Ethernet PHY Transceiver</li> </ul>
Signal Conditioning	<ul style="list-style-type: none"> <li>• <a href="#">CD1020</a>: Low-Cost 22-CH Multiple Switch Detect Interface</li> </ul>
CAN Transceiver	<ul style="list-style-type: none"> <li>• <a href="#">TJA144x</a>: Automotive CAN FD Transceiver Family</li> <li>• <a href="#">CAN Transceivers</a>: CAN Transceivers</li> </ul>

	<ul style="list-style-type: none"> <li>• <a href="#">Automotive LIN Solutions</a>: Automotive LIN Solutions</li> </ul>
Sensors	<ul style="list-style-type: none"> <li>• <a href="#">Sensors</a>: Sensors</li> </ul>
Power Management IC	<ul style="list-style-type: none"> <li>• <a href="#">FS23</a>: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN</li> <li>• <a href="#">FS24</a>: Safety Mini CAN FD SBC for Automotive Applications Fit for ASIL-B</li> <li>• <a href="#">System Basis Chips</a>: System Basis Chips</li> <li>• <a href="#">VR5500</a>: High Voltage PMIC with Multiple SMPS</li> <li>• <a href="#">FS5600</a>: Automotive Dual Buck Regulator and Controller with Voltage Monitors and Watchdog Timer</li> <li>• <a href="#">PF7100</a>: 7-Channel Power Management Integrated Circuit for High Performance Applications, Fit for ASIL B Safety Level</li> <li>• <a href="#">FS4500</a>: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver</li> <li>• <a href="#">FS6500</a>: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver</li> <li>• <a href="#">VR5510</a>: Multi-Channel (9) PMIC for S32G Processor – 8 High Power, 1 Low Power, Fit for ASIL D Safety Level</li> <li>• <a href="#">MMPF0100</a>: 14-Channel Configurable PMIC</li> <li>• <a href="#">PF5020</a>: Multi-Channel (5) PMIC for Automotive Applications – 4 High Power and 1 Low Power, Fit for ASIL B Safety Level</li> <li>• <a href="#">PF5024</a>: Multi-Channel (4) PMIC for Automotive Applications – 4 High Power, Fit for ASIL B Safety Level</li> </ul>
LED Backlight Driver	<ul style="list-style-type: none"> <li>• <a href="#">MC33996</a>: 16-Output Switch with SPI Control</li> </ul>
GPIO	<ul style="list-style-type: none"> <li>• <a href="#">PCAL9722</a>: 22-Bit SPI I/O Expander with Agile I/O Features</li> <li>• <a href="#">PCAL9714</a>: 14-Bit SPI I/O Expander with Agile I/O Features</li> </ul>

## 2D Instrument Cluster Block Diagram

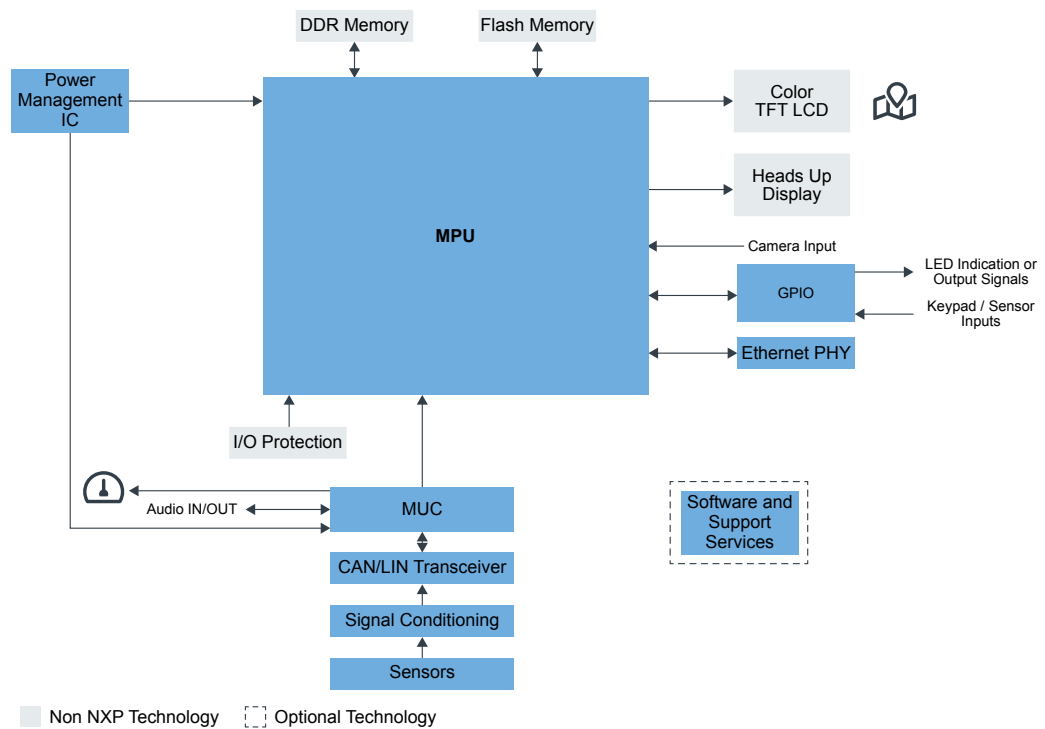


### Recommended Products for 2D Instrument Cluster

MCU	<ul style="list-style-type: none"> <li>• <a href="#">i.MX-RT1170</a>: i.MX RT1170: 1 GHz Crossover MCU with Arm® Cortex® Cores</li> <li>• <a href="#">i.MX93</a>: i.MX 93 Applications Processor Family – Arm® Cortex®-A55, ML Acceleration, Power Efficient MPU</li> <li>• <a href="#">MAC57D5xx</a>: Ultra-Reliable Multi-Core Arm®-Based MCU for Clusters and Display Management</li> <li>• <a href="#">MPC564xS</a>: Ultra-Reliable MPC56xS MCU for Automotive and Industrial Instrument Clusters</li> <li>• <a href="#">MPC560xS</a>: Ultra-Reliable MPC560xS MCU for Automotive and Industrial Instrument Clusters</li> </ul>
Automotive Ethernet	<ul style="list-style-type: none"> <li>• <a href="#">TJA1120</a>: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver</li> <li>• <a href="#">TJA1103</a>: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver</li> <li>• <a href="#">TJA1101</a>: TJA1101B, IEEE 100BASE-T1 Compliant Automotive Ethernet PHY Transceiver</li> </ul>
Signal Conditioning	<ul style="list-style-type: none"> <li>• <a href="#">CD1020</a>: Low-Cost 22-CH Multiple Switch Detect Interface</li> </ul>

Safety SBC	<ul style="list-style-type: none"> <li>• <a href="#">FS23</a>: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN</li> <li>• <a href="#">FS24</a>: Safety Mini CAN FD SBC for Automotive Applications Fit for ASIL-B</li> <li>• <a href="#">VR5500</a>: High Voltage PMIC with Multiple SMPS</li> <li>• <a href="#">FS5600</a>: Automotive Dual Buck Regulator and Controller with Voltage Monitors and Watchdog Timer</li> <li>• <a href="#">PF7100</a>: 7-Channel Power Management Integrated Circuit for High Performance Applications, Fit for ASIL B Safety Level</li> <li>• <a href="#">FS4500</a>: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver</li> <li>• <a href="#">FS6500</a>: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver</li> <li>• <a href="#">VR5510</a>: Multi-Channel (9) PMIC for S32G Processor – 8 High Power, 1 Low Power, Fit for ASIL D Safety Level</li> <li>• <a href="#">MMPF0100</a>: 14-Channel Configurable PMIC</li> <li>• <a href="#">PF5020</a>: Multi-Channel (5) PMIC for Automotive Applications – 4 High Power and 1 Low Power, Fit for ASIL B Safety Level</li> <li>• <a href="#">PF5024</a>: Multi-Channel (4) PMIC for Automotive Applications – 4 High Power, Fit for ASIL B Safety Level</li> </ul>
Sensors	<ul style="list-style-type: none"> <li>• <a href="#">Sensors</a>: Sensors</li> </ul>
CAN Transceiver	<ul style="list-style-type: none"> <li>• <a href="#">TJA144x</a>: Automotive CAN FD Transceiver Family</li> <li>• <a href="#">Automotive LIN Solutions</a>: Automotive LIN Solutions</li> <li>• <a href="#">CAN Transceivers</a>: CAN Transceivers</li> </ul>
LED Backlight Driver	<ul style="list-style-type: none"> <li>• <a href="#">MC33996</a>: 16-Output Switch with SPI Control</li> </ul>
GPIO	<ul style="list-style-type: none"> <li>• <a href="#">PCAL9722</a>: 22-Bit SPI I/O Expander with Agile I/O Features</li> <li>• <a href="#">PCAL9714</a>: 14-Bit SPI I/O Expander with Agile I/O Features</li> </ul>

### 3D Instrument Cluster Block Diagram



**Recommended Products for 3D Instrument Cluster**

MPU	<ul style="list-style-type: none"> <li>• <b>i.MX95</b>: i.MX 95 Applications Processor Family: High-Performance, Safety Enabled Platform with eIQ<sup>®</sup> Neutron NPU</li> <li>• <b>i.MX6D</b>: i.MX 6Dual Processors - Dual-Core, 3D Graphics, HD Video, Multimedia, Arm<sup>®</sup> Cortex<sup>®</sup>-A9 Core</li> <li>• <b>i.MX8</b>: i.MX 8 Family – Arm<sup>®</sup> Cortex<sup>®</sup>-A53, Cortex-A72, Virtualization, Vision, 3D Graphics, 4K Video</li> <li>• <b>i.MX8X</b>: i.MX 8X Family – Arm<sup>®</sup> Cortex<sup>®</sup>-A35, 3D Graphics, 4K Video, DSP, Error Correcting Code on DDR</li> </ul>
MCU	<ul style="list-style-type: none"> <li>• <b>MAC57D5xx</b>: Ultra-Reliable Multi-Core Arm<sup>®</sup>-Based MCU for Clusters and Display Management</li> <li>• <b>MPC564xS</b>: Ultra-Reliable MPC56xS MCU for Automotive and Industrial Instrument Clusters</li> <li>• <b>MPC560xS</b>: Ultra-Reliable MPC560xS MCU for Automotive and Industrial Instrument Clusters</li> </ul>
Automotive Ethernet	<ul style="list-style-type: none"> <li>• <b>TJA1120</b>: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver</li> <li>• <b>TJA1103</b>: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver</li> <li>• <b>TJA1101</b>: TJA1101B, IEEE 100BASE-T1 Compliant Automotive Ethernet PHY Transceiver</li> </ul>

CAN/LIN Transceiver	<ul style="list-style-type: none"> <li>• <a href="#">TJA144x</a>: Automotive CAN FD Transceiver Family</li> <li>• <a href="#">TJA1043</a>: High-Speed CAN Transceiver with Standby and Sleep Mode</li> <li>• <a href="#">Automotive LIN Solutions</a>: Automotive LIN Solutions</li> </ul>
Power Management IC	<ul style="list-style-type: none"> <li>• <a href="#">VR5500</a>: High Voltage PMIC with Multiple SMPS</li> <li>• <a href="#">PF8101-PF8201</a>: 9-Channel Power Management Integrated Circuit (PMIC) for High-Performance Processing Applications</li> <li>• <a href="#">PF7100</a>: 7-Channel Power Management Integrated Circuit for High Performance Applications, Fit for ASIL B Safety Level</li> <li>• <a href="#">FS5600</a>: Automotive Dual Buck Regulator and Controller with Voltage Monitors and Watchdog Timer</li> <li>• <a href="#">FS4500</a>: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver</li> <li>• <a href="#">FS6500</a>: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver</li> <li>• <a href="#">VR5510</a>: Multi-Channel (9) PMIC for S32G Processor – 8 High Power, 1 Low Power, Fit for ASIL D Safety Level</li> <li>• <a href="#">MMPF0100</a>: 14-Channel Configurable PMIC</li> <li>• <a href="#">PF5020</a>: Multi-Channel (5) PMIC for Automotive Applications – 4 High Power and 1 Low Power, Fit for ASIL B Safety Level</li> <li>• <a href="#">PF5024</a>: Multi-Channel (4) PMIC for Automotive Applications – 4 High Power, Fit for ASIL B Safety Level</li> </ul>
Sensors	<ul style="list-style-type: none"> <li>• <a href="#">Sensors</a>: Sensors</li> </ul>
Signal Conditioning	<ul style="list-style-type: none"> <li>• <a href="#">MC33972</a>: MSDI with Suppressed Wakeup</li> </ul>
Software	<ul style="list-style-type: none"> <li>• <a href="#">i.MX Software</a>: i.MX Software and Development Tools</li> <li>• <a href="#">Professional Support for Processors and Microcontrollers</a></li> <li>• <a href="#">NXP Engineering Services</a>: NXP Engineering Services</li> </ul>
GPIO	<ul style="list-style-type: none"> <li>• <a href="#">PCAL9722</a>: 22-Bit SPI I/O Expander with Agile I/O Features</li> <li>• <a href="#">PCAL9714</a>: 14-Bit SPI I/O Expander with Agile I/O Features</li> </ul>

View our complete solution for [Digital Cluster](#).

**Note:** The information on this document is subject to change without notice.

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