



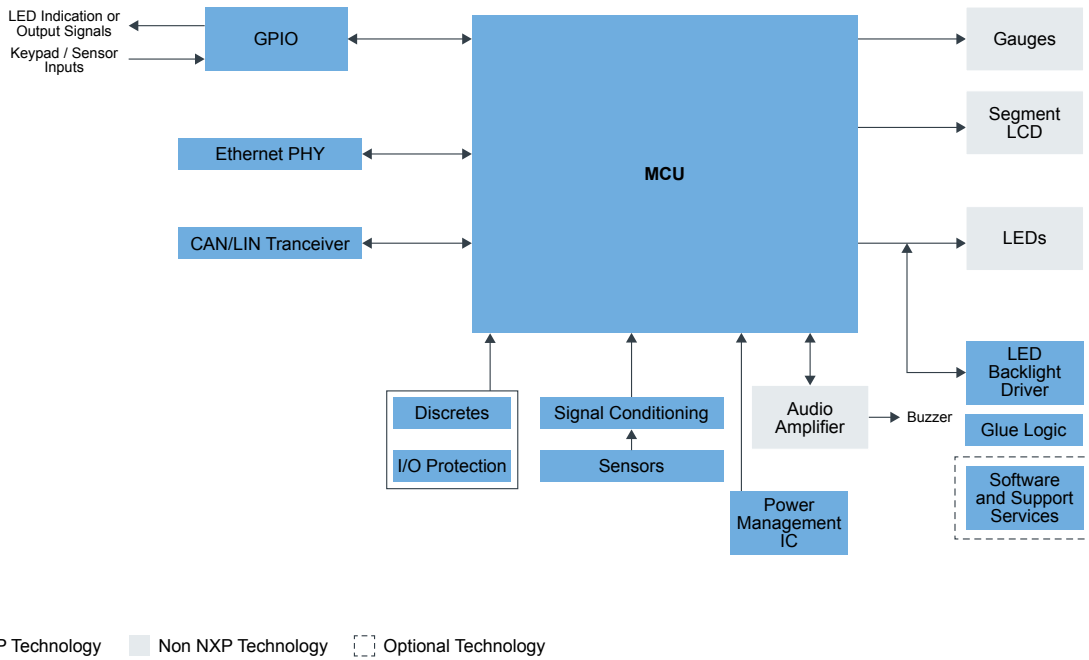
Digital Cluster

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

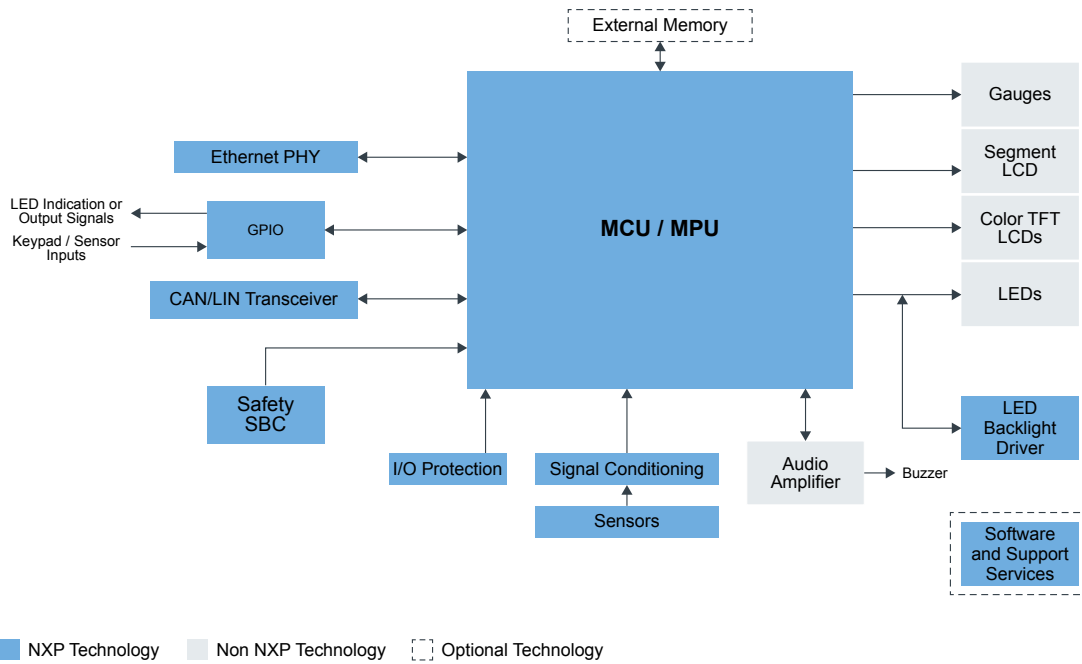


Recommended Products for Entry Instrument Cluster

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

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

2D Instrument Cluster Block Diagram

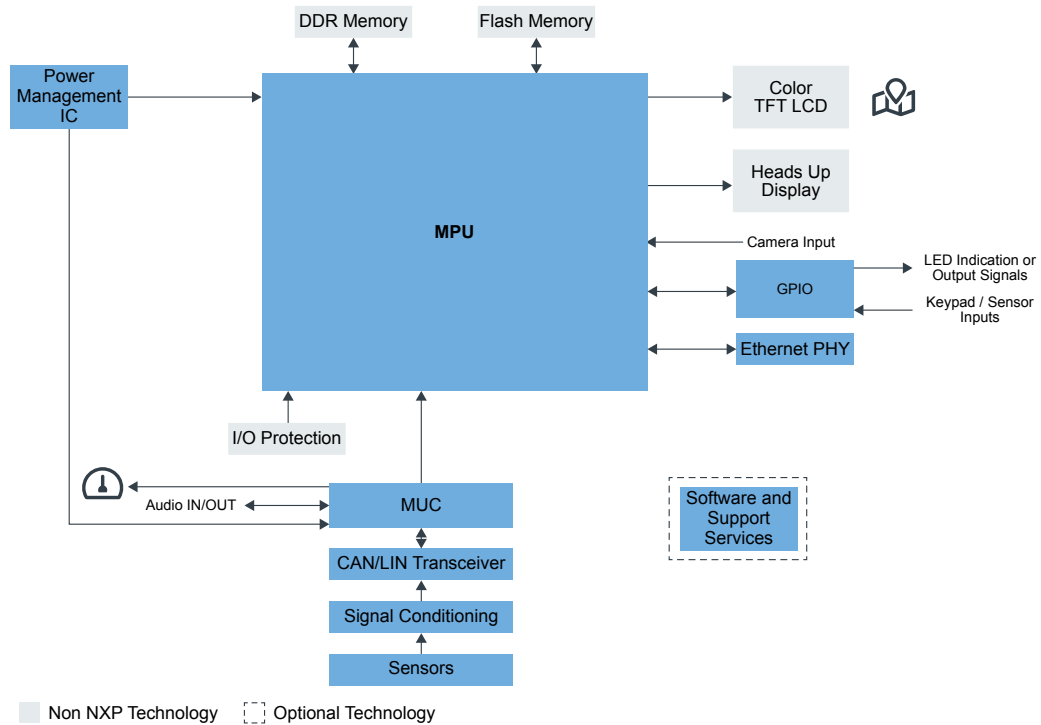


Recommended Products for 2D Instrument Cluster

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

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

3D Instrument Cluster Block Diagram



Recommended Products for 3D Instrument Cluster

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

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

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

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

www.nxp.com

NXP and the NXP logo are trademarks of NXP B.V. All other product or service names are the property of their respective owners. The related technology may be protected by any or all of patents, copyrights, designs and trade secrets. All rights reserved. © 2024 NXP B.V.