Digital Cluster

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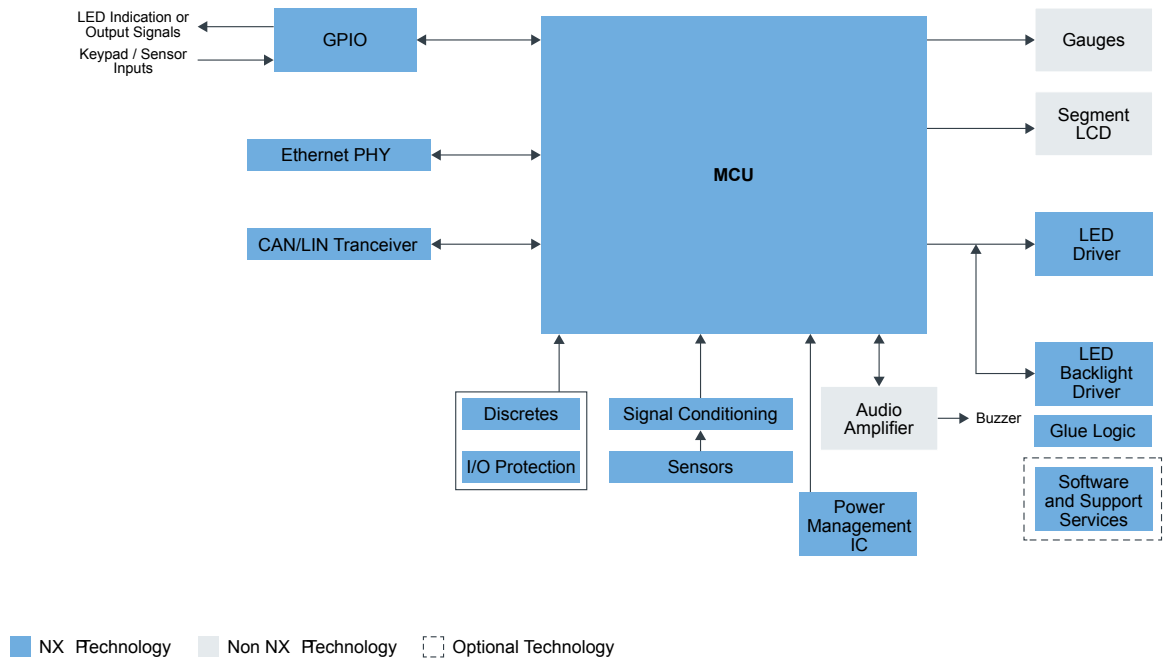
In the on-demand world, vehicles need to be able to offer a stylized yet simple way to convey complex information to drivers. Instrument clusters need to offer high-resolution colour displays with realistic visual renderings.

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 ecoystem development tools.

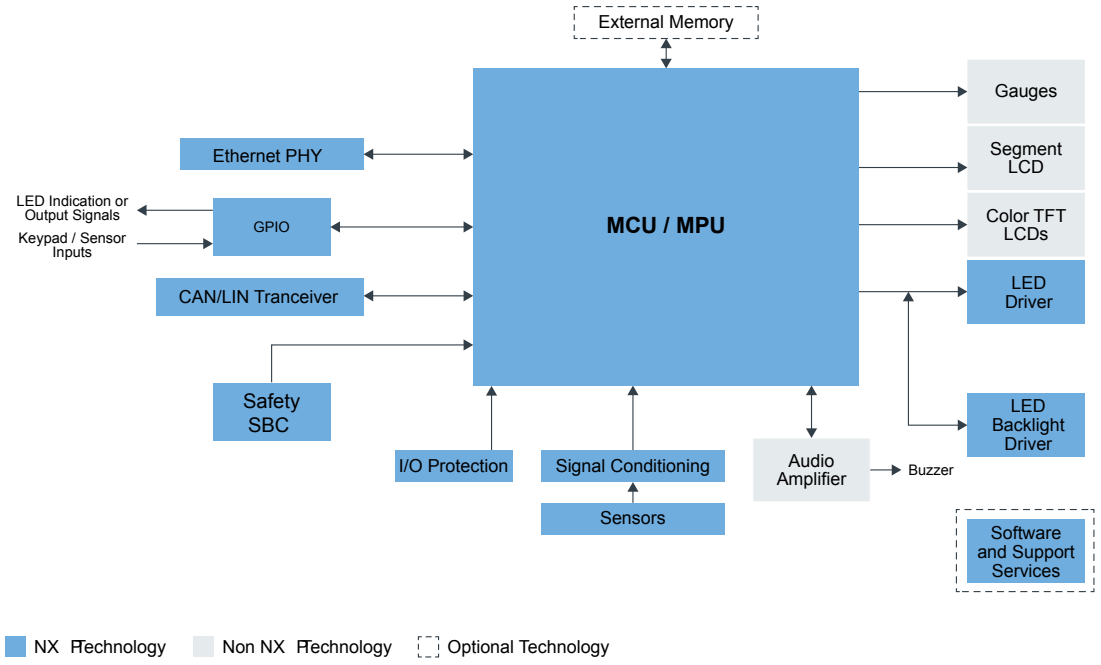
Entry Instrument Cluster Block Diagram



Recommended Products for Entry Instrument Cluster	
MCU	• 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	• TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • TJA1103: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • TJA1101: TJA1101B, IEEE 100BASE-T1 Compliant Automotive Ethernet PHY Transceiver
Signal Conditioning	• CD1020: Low-Cost 22-CH Multiple Switch Detect Interface
CAN Transceiver	• TJA144x: Automotive CAN FD Transceiver Family • CAN Transceivers: CAN Transceivers

	• Automotive LIN Solutions: Automotive LIN Solutions
Sensors	• Sensors: Sensors
Power Management IC	• 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	• MC33996: 16-Output Switch with SPI Control
GPIO	• PCAL9722: 22-Bit SPI I/O Expander with Agile I/O Features • PCAL9714: 14-Bit SPI I/O Expander with Agile I/O Features
LED Driver	• PCA9958HN: PCA9958 24-Bit 63 mA Current LED Driver with SPI

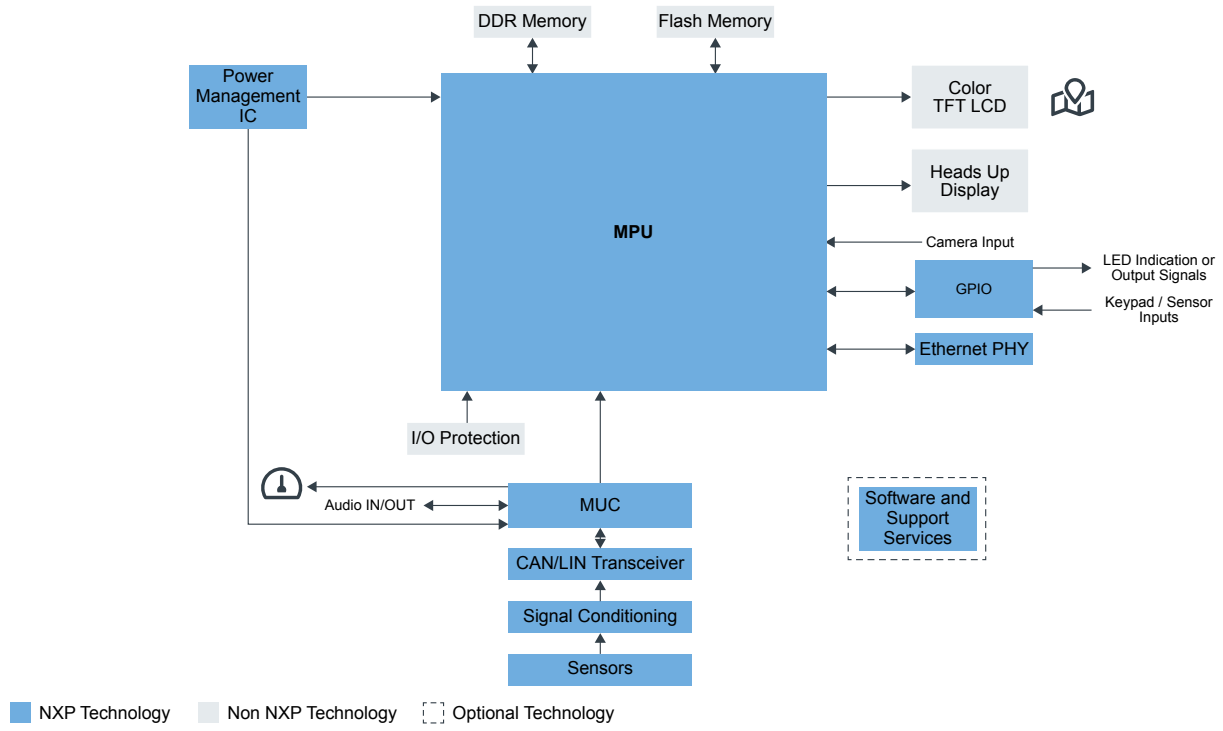
2D Instrument Cluster Block Diagram



Recommended Products for 2D Instrument Cluster	
MCU	• 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	• TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • TJA1103: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • TJA1101: TJA1101B, IEEE 100BASE-T1 Compliant Automotive Ethernet PHY Transceiver
Signal Conditioning	• CD1020: Low-Cost 22-CH Multiple Switch Detect Interface

Safety SBC	• 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	• Sensors: Sensors
CAN Transceiver	• TJA144x: Automotive CAN FD Transceiver Family • Automotive LIN Solutions: Automotive LIN Solutions • CAN Transceivers: CAN Transceivers
LED Backlight Driver	• MC33996: 16-Output Switch with SPI Control
GPIO	• PCAL9722: 22-Bit SPI I/O Expander with Agile I/O Features • PCAL9714: 14-Bit SPI I/O Expander with Agile I/O Features
LED Driver	• PCA9958HN: PCA9958 24-Bit 63 mA Current LED Driver with SPI

3D Instrument Cluster Block Diagram



Recommended Products for 3D Instrument Cluster	
MPU	• 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	• 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	• TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • TJA1103: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • TJA1101: TJA1101B, IEEE 100BASE-T1 Compliant Automotive Ethernet PHY Transceiver

CAN/LIN Transceiver	• 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	• 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	• Sensors: Sensors
Signal Conditioning	• MC33972: MSDI with Suppressed Wakeup
Software	• i.MX Software: i.MX Software and Development Tools • Professional Support for Processors and Microcontrollers • NXP Engineering Services: NXP Engineering Services
GPIO	• 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.