

BODY ELECTRICAL

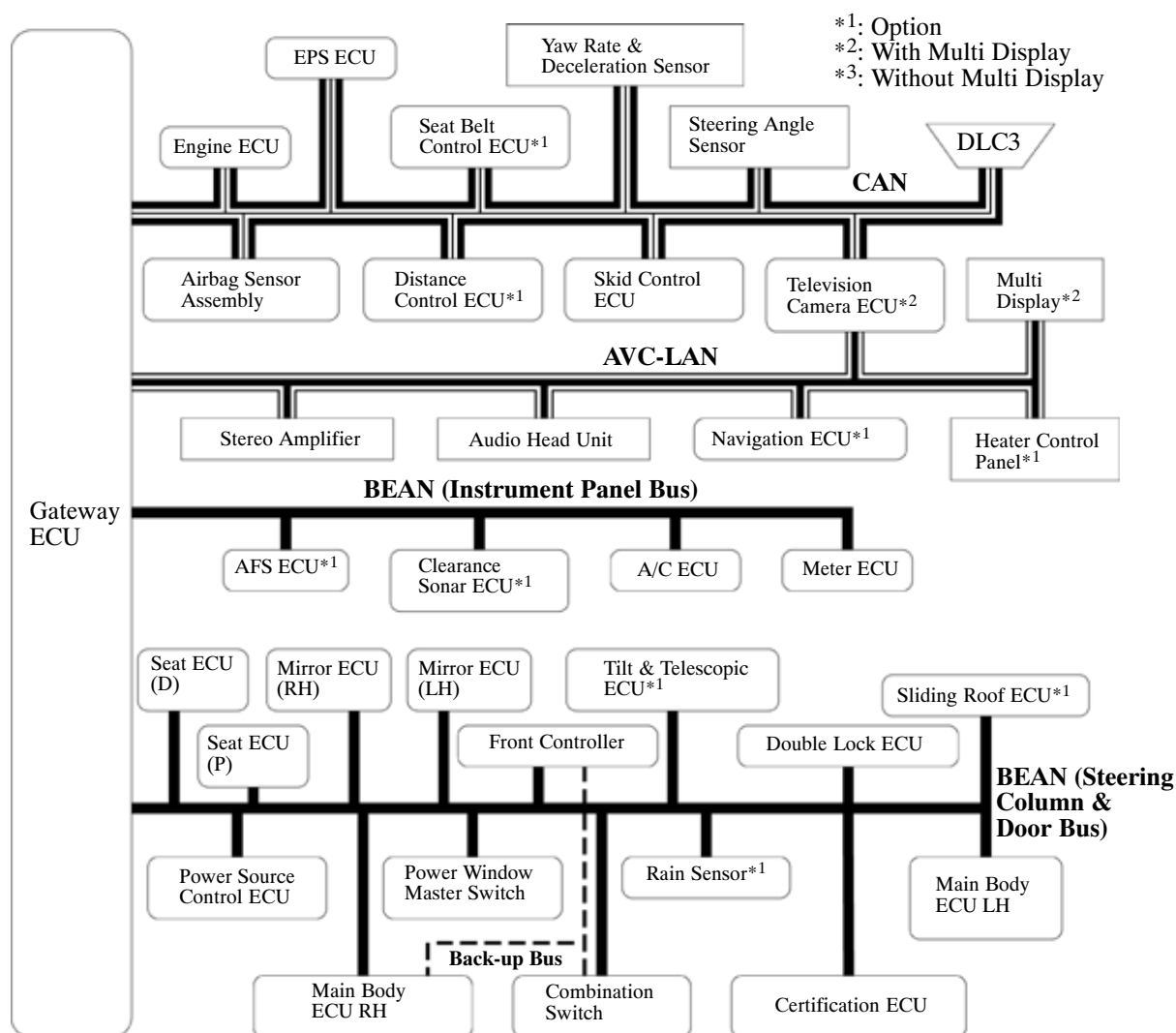
MULTIPLEX COMMUNICATION

DESCRIPTION

The multiplex communication system of the LEXUS IS250 uses 3 communication protocols. This system is centered around the Gateway ECU and allows for use of a lightweight and less complex wire harness. The three communication protocols are used on the CAN (Controller Area Network), BEAN (Body Electronics Area Network), and AVC-LAN (Audio Visual Communication – Local Area Network).

- Engine and Chassis electrical systems use CAN (Controller Area Network) protocol.
- Body electrical system uses BEAN (Body Electronics Area Network) protocol.
- The Audio Visual system uses AVC-LAN (Audio Visual Communication – Local Area Network) protocol.
- The Gateway ECU converts the different types of data, enabling the exchange of information between the different networks.
- A back up bus is provided to ensure lighting and wiper operation in the event of a disruption of communications that results from a malfunction.

System Diagram

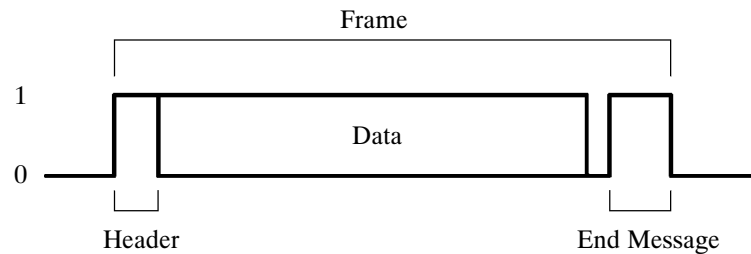


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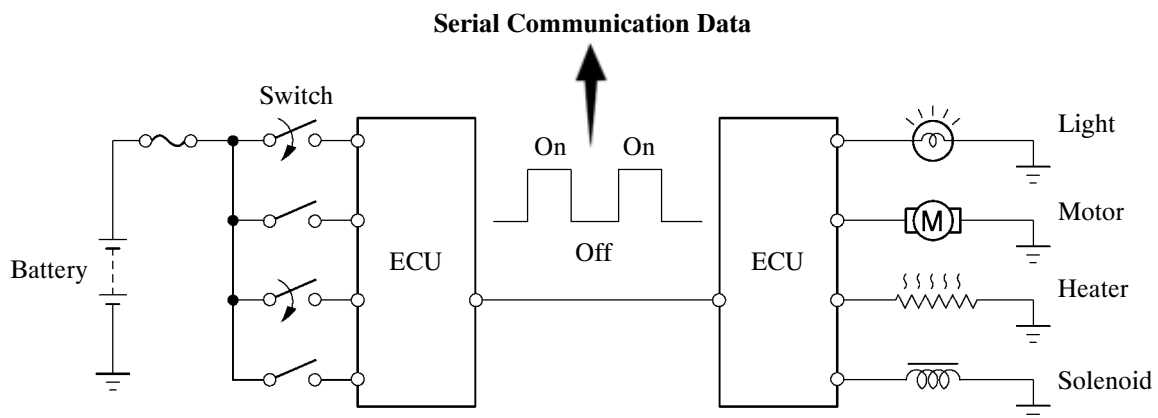
MPX communication uses serial communication data that consists of bits and frames in order to exchange information among the various ECUs. This allows a reduction of the amount of wiring on the vehicle.

- A bit is the basic unit of communication that is used to represent the amount of information. A bit is represented by binary values of “0” or “1”.
- A frame is a body of data that is transmitted together. A frame contains a header that indicates the beginning, and an end message that indicates the end.

► Conceptual Drawing ◀



240BE05



240BE03

■ DIFFERENCES BETWEEN CAN, BEAN AND AVC-LAN

The protocols, which are the rules for establishing data communication, differ between the CAN, BEAN and AVC-LAN. If the ECUs in the networks use different types of frameworks for their data, such as communication speed, communication wire, and signals, they will be unable to understand each other. Therefore, protocols (rules) must be established among them.

Protocol	CAN	BEAN	AVC-LAN
Communication Speed	500 k bps* (Max. 1 M bps)	Max. 10 k bps*	Max. 17.8 k bps*
Communication Wire	Twisted-pair Wire	AV Single Wire	Twisted-pair Wire
Drive Type	Differential Voltage Drive	Single Wire Voltage Drive	Differential Voltage Drive
Data Length	1-8 Byte (Variable)	1-11 Byte (Variable)	0-32 Byte (Variable)

Bps*: abbreviation for “Bits Per Second”, indicating the number of bits that can be transmitted per second.