Automotive & Embedded Info

Never Forget Basics Whether its Life or Anything Else ... Basics are Cores. While seeing a Tree how can we forget Seed...

UART

UART:

A universal asynchronous receiver/transmitter. a computer hardware device for asynchronous communication in which the data format and transmission speeds are configurable.

UARTs are commonly used in conjunction with communication standards such as TIA(formerly EIA) RS-232, RS-422 or RS-485. A UART is usually an individual (or part of an) integrated circuits(IC) used for serial communication over a computer or peripheral device serial port.

RS-232

WHAT IS RS-232?

Serial communication physical medium of single signal with some control signal like DTR, DCE, RTS &CTS etc.

LINES/SIGNALS INVOLVED IN RS-232: –

Nine(1. DCD 2. RXD 3. TXD 4. DTR 5. GND 6. DTS 7. RTS 8. CTS 9. RI.EXCEPT RXD, TXD and GROUND ALL ARE THE CONTROL SIGNAL.)

MAX SPEED & DISTANCE: –

Maximum speed: –

19.2 kbps for 50 feet.

Maximum distance: –

50 feet or 15 meters at 19.2 kbps. The standard does not define a maximum cable length but instead defines the maximum capacitance that a compliant drive circuit must tolerate. A 50 feet long cable will have too much capacitance. By using low capacitance cables, full speed communication can be maintained over larger distance up to about 1000 feet's (300 meter).

VOLTAGE LEVEL, CURRENT OUTPUT, NUMBER OF DEVICES AND DUPLEX: –

Voltage level: – voltage levels or signals range is either +3v to +15v or -3v to -15v with respect to gnd/common pin. Range between +3v to -3v is not a valid rs-232 level. For data transmission lines logic one is defined as negative voltage, the signal is called "mark". Logic zero is positive voltage, the signal is termed as "sace". Control signals have opposite polarity: the asserted or active state is positive voltage and de-asserted or inactive state is negative voltage. Example of control lines is RTS, CTS,

CURRENT OUTPUT: –

500 ma.

NUMBER OF DEVICES: –

1 transmits and 1 receives.

DUPLEX:

full duplex.

POINT TO POINT COMMUNICATION, SINGLE WIRE SIGNAL AND UNBALANCE SIGNAL: –

Communication between two nodes or communication between end points.

SINGLE SIGNAL WIRE COMMUNICATION?

One wire carries a varying voltage that represents the signal, while the other wire is connected to a reference voltage, usually ground.

UNBALANCED SIGNAL?

The two signal of an unbalanced connection are referred to as "signal" & "ground". The ground is zero reference while the signal has a voltage level that is above or below zero. This voltage determines whether a signal is 1 or 0. The level of signal voltage gets change when it comes in effect of some noisy environment.

RS-422

WHAT IS RS-422?

Serial communication physical medium of differential signal with full and half duplex mode.

LINES/SIGNALS OF RS-422: –

FOUR. 1. RX- 2. RX+ 3. TX+ 4. TX-

MAXIMUM SPEED AND DISTANCE: –

Maximum speed: – 10 mbps for 50 feet.

Maximum distance: – 4000 feet at 100 kbps

VOLTAGE LEVEL, CURRENT OUTPUT, NUMBER OF DEVICE AND DUPLEX: –

Voltage level: – of rs-422: –2v-min (b>a), 6v-max (b>a) à mark (data 1) & 2v-min (a>b), 6v-max (a>b) : space (data 0).

Duplex: – full duplex

Current output: – 150 ma.

Number of devices: – 5 transmitters & 10 receivers.

DIFFERENTIAL SIGNAL, BALANCE SIGNAL

Differential signal: –

Differential signalling is a method of transmitting information electrically with two complementary signal sent on two paired wires, called differential pair.

Balanced signal: –

Balanced signal have often called "current loop" signal and travel on "twisted pairs". The two in a balanced pair are like opposite charges of each other. If one wire has 12 v, the other will have -12v. As the signal travels the pair, one wire radiates a magnetic field but its partner wire generates an opposite field, the two fields cancel out. This cancelling is how balance signal conquers the crosstalk. The level of signal voltage does not gets change when it comes in effect of some noisy environment.

RS-485

WHAT IS RS-485?

Serial communication physical medium of differential signal with half duplex mode.

LINES/SIGNALS OF RS-485: –

TWO. 1. D+ 2. D-.

MAX SPEED AND DISTANCE: –

Maximum distance: – 4000 feet at 100 kbps.

VOLTAGE LEVEL, CURRENT OUTPUT, NUMBER OF DEVICES AND DUPLEX: –

Voltage Level: – 1.5V-MIN (B>A), 5V-MAX (B>A) à MARK (DATA 1)) & 1.5V-MIN (A>B), 5V-MAX (A>B) à SPACE (DATA 0).

Duplex: – HALF DUPLEX.

Current Output: – 250 MA.

Number of Devices: – 32 transmitter& 32 receivers.

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