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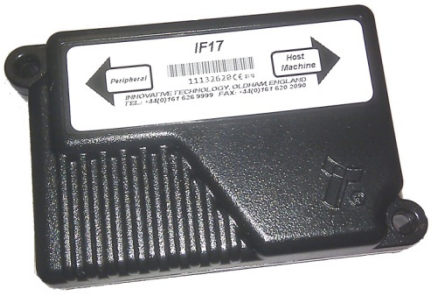
USB STABILITY – INTRODUCING IF17



The IF17 Serial communications interface, developed by Innovative Technology LTD is designed for interfacing between ITL devices and host machines using USB in a production environment.

The IF17 enables the use of USB cabling in the cabinet to be limited so communications over longer links is done using serial connections at TTL voltage levels. TTL communications are less susceptible to external noise than USB, therefore if short USB cables link the Host to the IF17, it will provide a stable connection. We recommend the use of USB cables certified to be at least USB2.0 and are less than 0.5 meters in length.

Outlined below are the protection features specifically designed into the IF17 to ensure stability.

1. Schottky Diodes are used in the 5V USB power bus to prevent back powering of the USB Host when it is unpowered and the ITL Device or IF17 is powered. This helps protect the IF17 and USB Host from potential damage.
2. The same Schottky diodes also prevent back powering of the IF17's transceiver chipset when attached to a powered ITL device when the IF17 has no external power connected. This helps protect the IF17 from potential damage.
3. A bi-directional ESD suppression device is used on the input of the 5V USB power source to protect the IF17 and any connected ITL device from externally applied ESD on the USB Host side, up to 8kV direct discharge.
4. A pi filter (comprising of a ferrite bead and ceramic capacitors) is used on the input of the 5V USB power source to reduce to risk of EM noise from the USB Host affecting operation of the IF17 and any connected ITL device. This filter also acts in the opposite direction to reduce the amount of any EM noise being generated by the IF17 or ITL device being transferred on to the USB Host power bus.
5. A common mode choke is used on the input of the USB data traces to reduce the amount of any common mode noise being transferred from the IF17 on to the USB data cable. This also works in the opposite direction to reduce any common mode noise present on the incoming signal to the IF17.
6. A dual bi-directional ESD suppression device is used on the input of the two USB data traces. This clamps the voltage of the USB data traces to no higher than 8V during an ESD event (up to 8kV direct discharge) occurring externally on the USB Host Side, protecting the IF17 and any connected ITL device.
7. A dual bi-directional ESD suppression device is used on the input of the SSP/serial data bus. This clamps the voltage of the USB data traces to no higher than 8V during an ESD event (up to 8kV direct discharge) occurring externally on the Serial Bus Side of the IF17, protecting the IF17 and the USB Host.
8. A Schottky diode on the 12/24V input prevents damage to the IF17 or any ITL connected device if a 12 or 24V supply is connected with reverse polarity.
9. RC pi filters on both the SSP/serial Tx & Rx data lines protect the IF17 from ESD damage and also help prevent damage caused by short duration over voltage events. Over voltage events sometimes occur on these lines when the Hopper is 'hot-plugged' on its base plate. This happens when 24V and data lines make contact before any GND connections during the hot-plug event. Improvements to the design of the Hopper baseplate connector prevent this from happening but the IF17 provides some protection against this for legacy base plates.

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