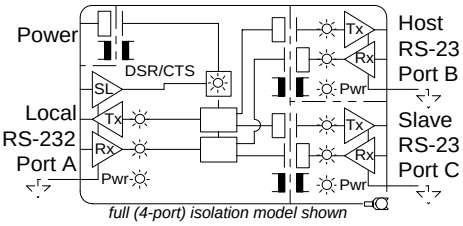
RDC 232IH USERS MANUAL

ISOLATED RS-232 AB SWITCH WITH AUTO-SELECT

1. INTRODUCTION

1.1. Block Diagram



full (4-port) isolation model shown

1.2. Product Over-view

The rdc232ih is an incredibly handy device for use in distributed industrial applications. It provides an electrically safe, fool-proof, hands-off method to "share" an RS-232 programming port with both a remote engineering work-station (EWS) and a local work-station or note-book computer (LPC). Once you use one, you'll never want to design a system without it again.

- ❑ Normally data flows freely between port B & C, allowing the EWS to program the local device.
- ❑ If the port A DSR is asserted, the rdc232ih will automatically switch so data flows freely between port A & C, allowing the LPC to program and control the local device.
- ❑ In both the partial (2-port) and full (4-port) isolation models port A has 2500v optical isolation from port B, port C, and the power supply. "Floating" port A isolates and protects the LPC from ground differences and surges between the panel and LPC power source. For example, your LPC may be powered from a standard wall outlet with non-UPS mains power - in effect a different ground system.
- ❑ In the full (4-port) isolation model all three ports (A, B, & C) have 2500v optical/galvanic isolation from each other and the power supply. This isolates and protects all three devices (LPC, EWS, & local device) from each other and the panel ground.
- ❑ With an isolated floating ground, RS-232 cable runs up to 50m can be guaranteed with quality, low-capacitance cable like Beldon 1422A at 42pF/m. (RS-232 requires less than 2500pF per signal)
- ❑ Port A can be extended to a conveniently placed, panel-mounted RS-232 port. This allows your LPC to be connected and disconnected without opening your panel. You never need to dig through a mess of cables within again. You never need to tamper with the cables, screws, or connectors on your local device again.
- ❑ For rapid troubleshooting, there are LED indicators for the Txd, Rxd, input power and isolated power.
- ❑ Wide power supply range (9 to 36vdc) allows use with 9v, 12v, 15v, 24v power supplies or direct from 12v or 24v battery systems.
- ❑ All three ports have both a 9-pin d-sub shell connector (AT style) and large capacity compression screw terminals, giving maximum flexibility in installation in panels and terminal boxes.
- ❑ 600 watt transient suppresser diodes are installed on any isolated port. (600w for 1ms with less than 1psec response to over-voltage)

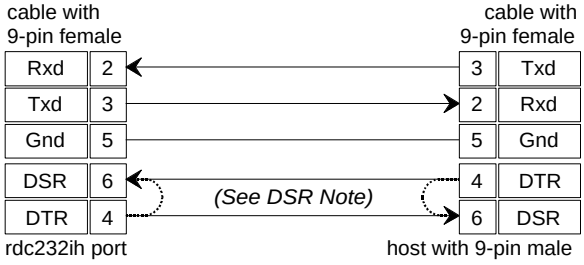
2. INSTALLATION

2.1. Making Direct Cables

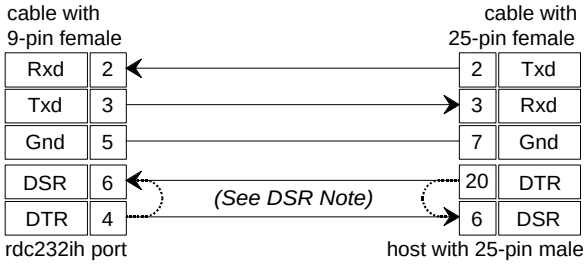
The rdc-232ih has three 9-pin male ports configured as in a standard "AT" style COM port. Txd, Rxd, and SGnd (pins 2, 3, 5) must be connected properly for normal 3-wire RS-232 communications. No control signals (DTR, DSR, RTS, CTS, CD, or RI) pass through the rdc232ih.

The DTR signal (pin 4) is asserted (forced HIGH) on all 3 ports. Only DSR (pin 6) of port A has any function. ***DSR Note***: To make the rdc232ih switch, you must create a cable which asserts DSR on port A when you want it to switch. There are basically two cables designs which do this.

1) Jumper pin 4 & 6 at port A. The rdc232ih will sense it's DTR and switch when the cable is connected.
2) Connect pin 6 of port A to the DTR of your LPC. The rdc232ih will sense when the LPC activates it's COM port and switch when active.



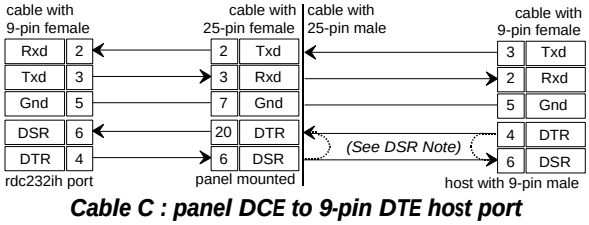
Wiring Diagram A : host with 9-pin DTE port



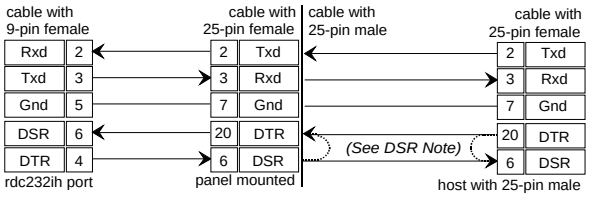
Wiring Diagram B : host with 25-pin DTE port

2.2. Making a Panel-Mount Extension Cable

Alternatively, you can extend port A to a 9 or 25-pin port mounted conveniently on your front panel. Below are 2 example wiring drawings. If this panel-mounted port looks like a 25-pin DCE (modem) port, then you can use any "modem cable" to connect to it. Or make the panel-mounted port to be like your normal device port and you can use your standard programming cable - provided you connect or loop-back DTR/DSR.



Cable C : panel DCE to 9-pin DTE host port



Cable D : panel DCE to 25-pin DTE host port

2.3. Compression screw terminals:

All three RS-232 ports also have Txd, Rxd, and Gnd signals available as screw terminals along the top (however, the DSR signal for port A is *not available* as a screw terminal). They will hold wires with lugs or ferrules up to 2.5mm². These may be more effective in some system designs.

These screw terminals can be used with a DVM or voltage meter to instantly verify correct cable wiring. When properly wired, both Txd and Rxd must be in the range of -3 to -15vdc. If you have your wires swapped, then only Txd will be correct and Rxd will be only 0v.

2.4. Planning the panel wiring:

Power Supply: A fuse should be installed in the V+ supply wire. Models with full (4-port) isolation have internal diodes for full protection against reverse wiring the supply. Models with partial (2-port) isolation have internal diodes which will attempt to blow this fuse should you reverse wire the supply.

RS-232 Connection: The RS-232 connection is wired as described above. You may need to jumper the DTR/DSR or RTS/CTS pins in the host. end of the cable -- this depends on your application software (it never hurts to do it!). 24 to 28 AWG shielded cable with a shield drain wire is suggested. Ground the shield only at the remote end (not at the rdc232ih).

RS-232 Lightning Protection: If required, RS-232 field wires can be protected by standard lightning protection devices. RDC suggests 15v or 16v surge protection - but if you expect lightning problems then RS-232 is a bad standard to use. It is both limited in distance and sensitive to capacitance > 2500pF - and all good lightning protection devices will add 10,000pF or more.

3. TECHNICAL SPECIFICATION

3.1. Port Description

3.1.1. **RS-232**; 3-wire RS-232; Signals: Txd, Rxd, SGnd; Working voltage range ±9vdc; Max voltage range ±15vdc; Max surge ±25vdc

3.1.2. **Duplex**; Operation can be either half or full-duplex; No configuration required

3.1.3. **Speed**; Tested to 115K baud; No configuration required

3.1.4. **Character Setting**; Operates with any combination of parity, data, stop, and start bits; No configuration required

3.2. Isolation (Per ISO/IEC 9549)

3.2.1. **Port A to B & C**; 2.5Kv (optical, 5Kv test)

3.2.2. **Port A to Supply**; 2.5Kv (galvanic, 3Kv test)

3.2.3. **Port B to C**; model "-2p" none ; model "-4p" 2.5Kv

3.2.4. **Port B to Supply**; model "-2p" none ; model "-4p" 2.5Kv

3.2.5. **Port C to Supply**; model "-2p" none ; model "-4p" 2.5Kv

3.2.6. **Casing**; dielectric strength per DIN VDE 0303/part 2 is 400kV/cm

3.3. Power Supply

3.3.1. **Model rdc232ih-5v**; 5vdc ±5%; Max 150mA

3.3.2. **Model rdc232ir3-av-4p**; 9 to 36vac; 1.6w

3.3.3. **Model rdc232ir3-dv-4p**; 9 to 36vdc; 1.6w

3.4. Environmental

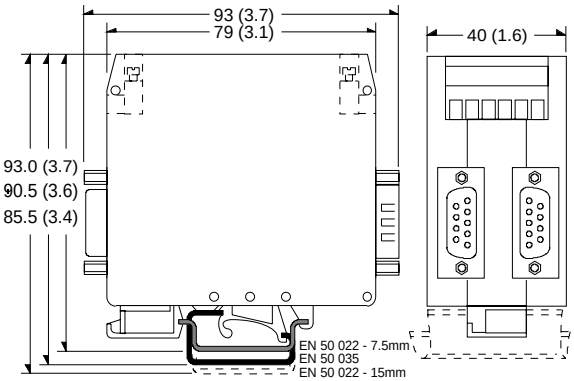
3.4.1. **Ambient Operating Temperature**; -20C to +65C

3.4.2. **Ambient Storage Temperature**; -40C to +100C

3.4.3. **Relative Humidity**; 10 to 90%, non condensing

3.4.4. **Casing;** fungus and termite resistant

3.4.5. **Casing; flame characteristics**: self-extinguishing per UL 94 V2



3.5 Mechanical Dimensions

3.5.1 **Height; Width; Depth** *(See drawing).*

3.5.2 **Weight***; 200g.*

3.5.3 **Terminal Capacity**; 2.5mm strand (12 AWG

3.5.4 **Mounting Rail**; DIN EN 50022 (35mm sym) DIN EN 50025 (32mm asym) Note: removal from a DIN EN 50025 rail is difficult.