

USER MANUAL

MODEL 590A and MODEL 591A RS-232 to RS-232 Optical Isolators



PATTON
Electronics Co.



An ISO-9001
Certified
Company

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 590A/591A components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

1.1 FCC INFORMATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

1.2 CE NOTICE

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the Union European (EU). A Certificate of Compliance is available by contacting Patton Technical Support.

1.3 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Service at:

Tel: **(301) 975-1007**

E-mail: **support@patton.com**

URL: **www.patton.com**

Note Packages received without an RMA number will not be accepted.

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model 590A/591A. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for One Year parts and labor. If any questions or problems arise during installation or use of this product, please do not hesitate to contact **Patton Electronics Technical Support at (301) 975-1007**.

2.1 FEATURES

- Asynchronous
- Full or Half Duplex Operation
- Supports Data Rates to 19.2 kbps (Model 590A) or 115.2 kbps (Model 591A)
- 2500V RMS DTE-DCE Isolation
- Optional Power Supplied through Pin 9 on Either Side
- Powered by EIA-232 Interface
- Miniature Size
- Made in USA

2.2 DESCRIPTION

The Patton Model 590A/591A RS-232 to RS-232 Optical Isolators offer a simple and effective way to guard your asynchronous data and equipment from the hazards of ground looping. Plugging directly into your DTE hardware, the Model 590A/591A provides 2500V RMS of DTE/DCE isolation. The Model 590A/591A supports data rates to 19.2 kbps and Model 591A supports up to 115.2kbps.

The Model 590A/591A isolate four RS-232 signals. In addition to two data lines (TD, RD), Model 590A/591A passes one user-configurable control signal in each direction. That makes it perfect for applications that require hardware flow control. Just plug it in between DTE and DCE equipment—no external power is required. Standard DB-25 female connectors on both sides connect to the equipment ports.

3.0 CONFIGURATION

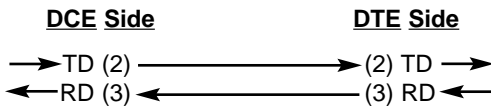
The Model 590A/591A is equipped with two eight-position DIP switches that allow configuration to a wide range of applications. This section describes all possible configuration settings, including the factory default settings.

3.1 CHECKING THE DEFAULT CONFIGURATION

The Model 590A/591A passes four optically isolated signals between the connected RS-232 DCE and DTE devices. The data signals, TD (pin 2), and RD (pin 3), have been dedicated and cannot be changed. Use two sets of DIP switches to set the control.

Data Signals: Transmit Data (TD) and Receive Data (RD):

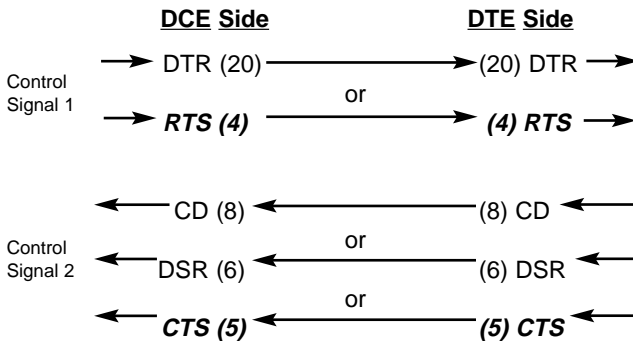
The Transmit Data and Receive Data signals cannot be altered. The diagram below shows the TD and RD signal directions.



Control Signals*: DTR/RTS, and CD/DSR/CTS

The Model 590A/591A passes *one* control signal in each direction. There it allows you to use it in applications that require hardware flow control. You may select either DTR or RTS in one direction, and CD, DSR or CTS in the other direction.

Before opening the Model 590A/591A's case, check the default control signal settings (shown below). If the default configuration is correct, move to Section 4.0 of this manual. Otherwise, proceed to section "Setting the Internal Switches" to change the control signal settings.



NOTE:** Default control signals are shown above in ***bold italics

3.2 SETTING THE INTERNAL SWITCHES

All switches and jumpers are located on the top side of the Model 590A or Model 591A PC board. To access the PC board, open the case by inserting a small flat-blade screwdriver in the slot on either side of the case and twisting gently. Figure 1 shows the location of the DIP switches on the circuit board.

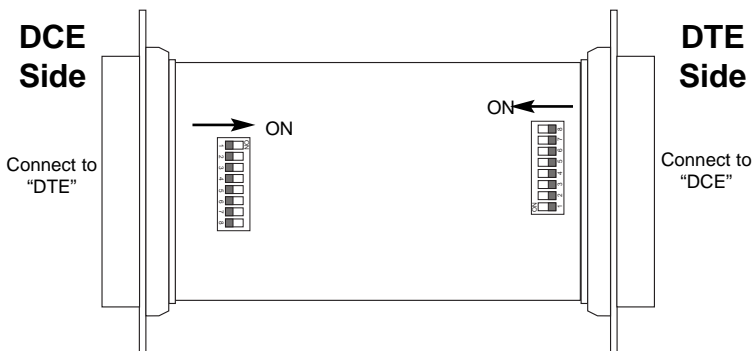


Figure 1. Model 590A/591A PC board, showing jumper locations and DTE/DCE Orientation

The two sets of DIP switches on the underside of the Model 590A/591A will be referred to as S1 and S2. Figure 2 shows the orientation of DIP Switches S1 and S2 with respect to “ON” and “OFF” positions.

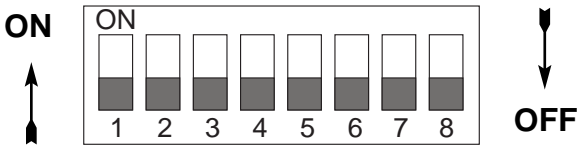


Figure 2. Close-up of DIP Switches Showing ON/OFF Positions

Selecting the DTE Output Signals (DTR or RTS)

Use Switches S1-1, S1-2, S2-1 and S-2-2 to connect either Data Terminal Ready (DTR - pin 20) or Request to Send (RTS - pin 4). In the “Isolated” setting, the selected signal passes through Model 590A/591A isolated up to 2500VRMS.

Table 1: Connect DTR Signal (Pin 20)

Switch	Isolated Signal	Setting
S1-1	DTR	On
S1-2	DTR	Off
S2-1	DTR	On
S2-2	DTR	Off
NOTE: Default Settings		

Table 2: Connect RTS signal (Pin 4)

Switch	Isolated Signal	Setting
S1-1	RTS	Off
S1-2	RTS	On
S2-1	RTS	Off
S2-2	RTS	On

3.3 SELECTING THE DCE OUTPUT SIGNALS (CTS, DSR, OR CD)

Use Switches S1-3, S1-4, S1-5, S2-3, S2-4, and S2-5 to connect either Clear to Send (CTS - pin 5), Data Set Ready (DSR - pin 6), or Carrier Detect (CD - pin 8). In the "Isolated" setting, the selected signal passes through Model 590A/591A isolated up to 2500VRMS.

Table 3: Connect CTS signal (Pin 5)

Switch	Isolated Signal	Setting
S1-3	CTS	Off
S1-4	CTS	Off
S1-5	CTS	On
S2-3	CTS	Off
S2-4	CTS	Off
S2-5	CTS	On

Table 4: Connect DSR signal (Pin 6)

Switch	Isolated Signal	Setting
S1-3	DSR	Off
S1-4	DSR	On
S1-5	DSR	Off
S2-3	DSR	Off
S2-4	DSR	On
S2-5	DSR	Off

Table 5: Connect CD signal (Pin 8)

Switch	Isolated Signal	Setting
S1-3	CD	On
S1-4	CD	Off
S1-5	CD	Off
S2-3	CD	On
S2-4	CD	Off
S2-5	CD	Off

Note Switches S1-6, S1-7, S1-8, S2-6, S2-7, and S2-8 are **Reserved for Future Use**.

4.0 INSTALLATION

The Model 590A/591A provides 2500VRMS optical isolation between a DTE and a DCE device. It plugs directly into the DTE and connects to the DCE by a short cable. No additional power is required in most cases. Refer to the diagram below and follow the instructions to install the Model 590A/591A.

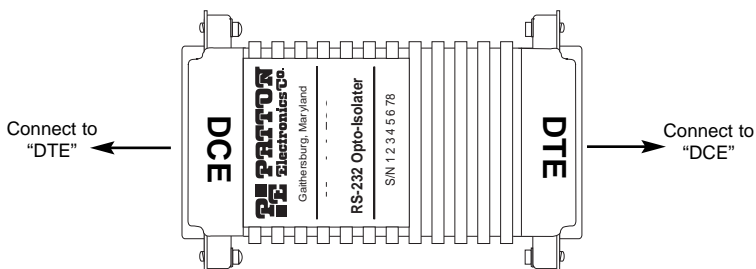


Figure 3. Model 590A/591A DTE and DCE connector locations

1. Plug the DB-25 female connector labeled "DCE" of Model 590A or 591A directly into the DB-25 male RS-232 port on your DTE device (PC, terminal, host, etc.). If your DTE device has a connector other than a male DB-25, or if you need greater distance from the RS-232 interface, use *straight through* cable.
2. Connect the DB-25 female connector labeled "DTE" on the Model 590A/591A to your DCE device.
3. When installed according to the instructions above, the Model 590A/591A is designed to operate transparently. There is no ON/OFF switch; the unit is operational as soon as power is supplied.

Note In most cases, Model 590A/591A requires no additional power to work. However, if the connected interfaces supply insufficient power on the DTE or DCE interface, a Patton Electronics Power Supply (Model 3P-MF) can be added. The Patton Model 3P-MF supplies additional power at +9VDC at 10mA.

APPENDIX A
MODEL 590A/591A SPECIFICATIONS

A.1 TRANSMISSION FORMAT

Asynchronous, full or half duplex

A.2 INTERFACE STANDARD

EIA RS-232-E

A.3 CONNECTORS

Two DB-25 Female

A.4 DATA RATES

- Up to 19,200 bps (Model 590A)
- Up to 115,200 bps (Model 591A)

A.5 ISOLATION

2500VRMS

A.6 POWER SUPPLY

Interface Powered; Optional power supplied to pin 9 (either side) at +9 VDC at 10mA

A.7 COMPLIANCE

89/336/EEC, FCC Part 15, Class A

A.8 DIMENSIONS

3.8L x 2.1W x 0.79H in. (9.7L x 5.3W x 2.0H cm)

A.9 TEMPERATURE RANGE

0–50°C (32–122°F)

A.10 ALTITUDE

Up to 10,100 feet

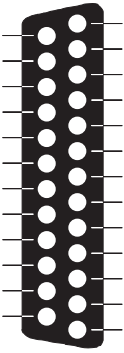
A.11 WEIGHT

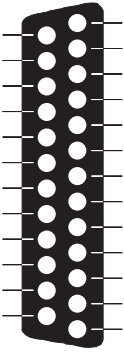
5.7 oz. (161.6g)

A.12 HUMIDITY

5–95%, non-condensing

APPENDIX B
MODEL 590A/591A PIN ASSIGNMENTS

DIRECTION	RS-232 Female "DCE" SETTING	DIRECTION
To Model 59XA	 <p>1- (FG) Frame Ground 2- (TD) Transmit Data 3- (RD) Receive Data 4- (RTS) Request to Send 5- (CTS) Clear to Send 6- (DSR) Data Set Ready 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect 9- External Power</p> <p>Data Term. Ready (DTR) - 20</p>	To Model 59XA From Model 59XA To Model 59XA From Model 59XA From Model 59XA From Model 59XA From Model 59XA To Model 59XA To Model 59XA

DIRECTION	RS-232 Female "DTE" SETTING	DIRECTION
From Model 59XA	 <p>1- (FG) Frame Ground 2- (TD) Transmit Data 3- (RD) Receive Data 4- (RTS) Request to Send 5- (CTS) Clear to Send 6- (DSR) Data Set Ready 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect 9- External Power</p> <p>Data Term. Ready (DTR) - 20</p>	From Model 59XA To Model 59XA From Model 59XA To Model 59XA To Model 59XA To Model 59XA To Model 59XA To Model 59XA To Model 59XA

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