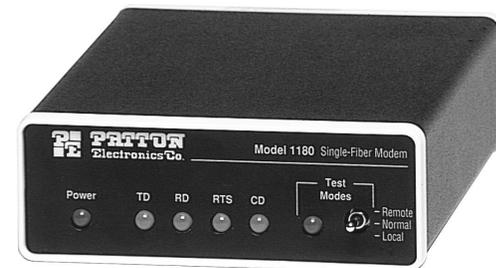


USER MANUAL

MODEL 1180/35 Single Fiber V.35 Short Range Modem



PATTON
Electronics Co.



An ISO-9001
Certified Company

Part# 07M1180/35-B
Doc# 017071UB
Revised 4/20/98

SALES OFFICE
(301) 975-1000
TECHNICAL SUPPORT
(301) 975-1007
<http://www.patton.com>

1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1180/35 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 RADIO AND TV INTERFERENCE

The Model 1180/35 generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. This unit has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If this unit does cause interference to radio or television reception, which can be determined by turning the power off, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna, and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

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 Technical Services.

1.3 SERVICE

All warranty and nonwarranty 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 Services at:

telephone: **(301) 975-1007**
email: **support@patton.com**
web address: **http://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 Patton Model 1180/35. 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 by Patton's qualified technicians. 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

- Communicates full duplex over a single multimode fiber
- Synchronous data rates to 256 Kbps
- Hardware and software flow control support
- Internal, external or received recover clock
- Distances to 1.5 miles (over 64 Kbps)
- Distances to 3 miles (64 Kbps and under)
- ST or SMA fiber connectors
- V.35 DTE interface with female M/34
- Local and remote loopback diagnostics
- Tri-State front panel LED indicators
- Made in USA

2.2 DESCRIPTION

The Model 1180/35 Single Fiber V.35 Short Range Modem accomplishes full duplex, point-to-point V.35 communication over a *single* multimode fiber. Supporting synchronous data rates up to 256 Kbps, the Model 1180/35 automatically adapts to hardware or software flow control, and can be set for internal, external or received recover clocking.

The Model 1180/35 features extended data rate circuitry that allows for single fiber distances up to 1.5 miles at data rates above 64 kbps, or 3 miles at data rates below 64 kbps. Both local and remote loopback tests can be activated from the front panel, or from the V.35 interface. The Model 1180/35 front panel incorporates LED indicators for TD, RD, RTS, CD and power.

Optical fiber may be connected to the Model 1180/35 using an ST or SMA type interface. The V.35 DTE interface on the Model 1180/35 is a female M/34 connector.

3.0 CONFIGURATION

The Model 1180/35 uses an eight switch package that allow s configuration to a wide range of synchronous applications. Because all eight switches are externally accessible (see Figures 1 and 2, below), there is no need to open the Model 1180/35's case for configuration.

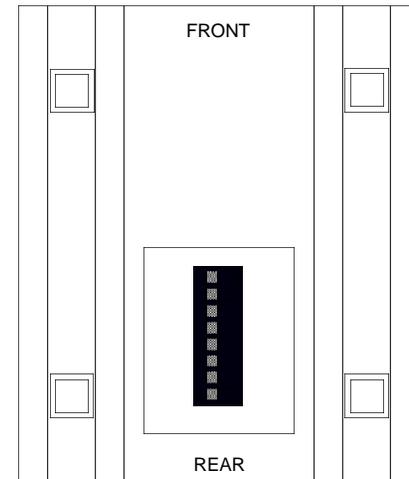


Figure 1. Switch Locations Underneath Model 1180/35

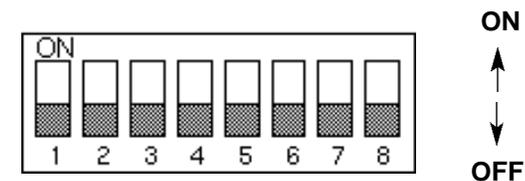


Figure 2. Close-up of 1180/35 DIP Wswitch Package Showing OFF/ON Positions

3.1 DETAILED SWITCH SETTINGS

The Model 1180/35's configuration switches set data rate (distance), sync clock source, and DTE control of the RDL and LAL test modes. The table on the following page summarizes the default switch settings for the Model 1180/35. Following this table is a detailed description of each switch function.

S1 SUMMARY TABLE			
Position	Function	Factory Default	
S1-1	Data Rate (Distance)	Off	} 64 kbps (2x)
S1-2	Data Rate (Distance)	Off	
S1-3	Data Rate (Distance)	Off	
S1-4	Data Rate (Distance)	On	
S1-5	Clock Source	On	} Internal
S1-6	Clock Source	On	
S1-7	DTE Control of RDL	Off	Disabled
S1-8	DTE Control of LAL	Off	Disabled

Switches S1-1 through S1-4: Data Rate (Distance)

Switches S1-1 through S1-4 are set in combination to determine two configuration parameters: synchronous data rate and maximum distance. Maximum distance is determined by the space between data packets in the communication stream between two Model 1180/35s. The "2X" setting *doubles* the space between data packets, when compared with the normal "1X" setting, and therefore *doubles* the maximum distance. A setting of "2X" facilitates communication distances up to 3 miles, and is available at certain data rates *up to* 64 kbps. A setting of "1X" supports communication at the normal distance of 1.5 miles.

<u>S1-1</u>	<u>S1-2</u>	<u>S1-3</u>	<u>S1-4</u>	<u>Data Rate (Distance)</u>
On	On	On	Off	2.4 (1X)
Off	On	On	On	9.6 (2X)
On	Off	On	Off	14.4 (1X)
On	Off	On	On	19.2 (2X)
Off	Off	On	Off	28.8 (1X)
Off	Off	On	On	38.4 (2X)
On	On	Off	On	48.0 (2X)
Off	On	Off	Off	56.0 (1X)
Off	Off	Off	On	64.0 (2X)
Off	On	On	Off	72.0 (1X)
Off	Off	Off	Off	128.0 (1X)
On	On	Off	Off	144.0 (1X)
Off	On	Off	On	192.0 (1X)
On	On	On	On	256.0 (1X)

S1-5 and S1-6: Clock Source

Switches S1-1 and S1-2 are set in combination to determine the source of the transmit clock for the Model 1180/35.

<u>S1-5</u>	<u>S1-6</u>	<u>Setting</u>
Off	Off	Received Recover Clock
On	Off	Internal Clock
Off	On	External Clock
On	On	Internal Clock

S1-7: DTE Control of RDL

The setting for switch S1-7 determines whether the V.35 DTE can activate the RDL test by raising pin L. If DTE Control of RDL is enabled, control from the front panel is disabled if there is no DTE connected.

NOTE: If DTE control is not available, set Switch S1-7 to off.

<u>S1-7</u>	<u>Setting</u>
On	DTE control of RDL enabled
Off	DTE control of RDL disabled

S1-8: DTE Control of LAL

The setting for switch S1-8 determines whether the V.35 DTE can activate the LAL test by raising pin N. If DTE Control of LAL is enabled, control from the front panel is disabled if there is no DTE connected.

NOTE: If DTE control is not available, set Switch S1-8 to off.

<u>S1-8</u>	<u>Setting</u>
On	DTE control of LAL enabled
Off	DTE control of LAL disabled

4.0 INSTALLATION

The Model 1180/35 is easy to install. After configuring the DIP switches, simply connect the single fiber cable, hook up the V.35 interface, and plug the power supply adapter into the 1180/35. Figure 4 (below) shows the location of the interface connections on the Model 1180/35 rear panel.

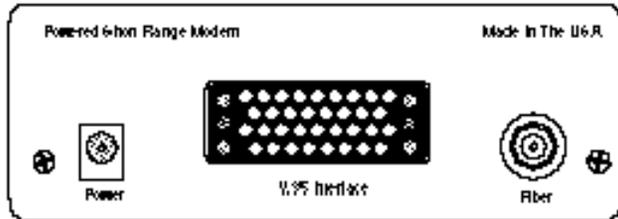


Figure 4. Rear Panel of Model 1180/35 Showing Interface Connections

4.1 SINGLE FIBER CONNECTION

These short range modems are designed to work in *pairs*. You will need one at each end of single multi-mode fiber cable. Depending upon the data rate setting you select, your cable may be a maximum of 1.5 or 3 miles long. The fiber cable connects to each Model 1180/35 using either an ST or an SMA connector. Figure 5 (below) shows a close-up of both connector types.

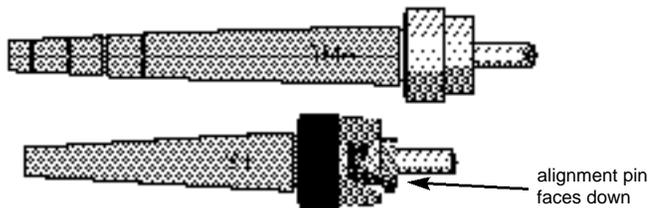


Figure 5. Close-up of ST and SMA Connections

4.2 V.35 CONNECTION

The Model 1180/35 is configured as a DCE. Therefore it “wants” to DTE hardware such as a PC, host or terminal, using a *straight through* V.35 cable. Connecting the Model 1180/35 to DCE hardware such as a modem, multiplexer, or printer, requires a *null modem* V.35 cable. Contact Patton Technical Support at (301) 975-1007 for more information about constructing the appropriate null modem cable for your application.

5.0 OPERATION

Once you have configured each Model 1180/35 properly and connected the fiber and V.35 cables, you are ready to operate the units. This section describes reading the LED status monitors, power-up, and using the built-in loopback test modes.

5.1 LED STATUS MONITORS

The Model 1180/35 features six front panel status LEDs that indicate the condition of the modem and communication link. Figure 6 (below) shows the front panel location of each LED.

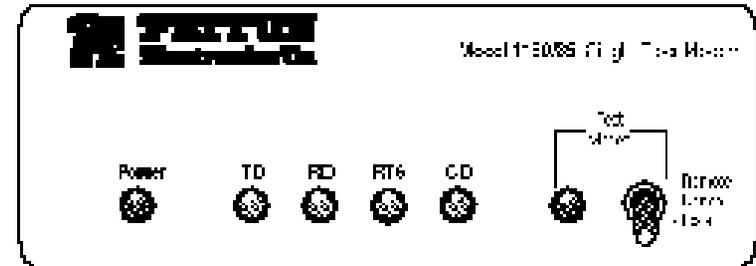


Figure 6. Front view of Model 1180/35

- The green "Power" LED glows if power is applied to the modem.
- The green "Test Modes" LED indicates that the modem is in a test mode (local analog or remote digital).
- The "TD" and "RD" indicators blink red and green with data activity. Red indicates a low V.35 logic level, green indicates a high V.35 logic level. Note: V.35 devices idle in a *low* state, so the LED will glow red if the connections are correct and the V.35 device is in an idle state.
- The "RTS" and "CD" indicators are also tri-state and will glow red for a "low" signal or green for a "high" signal. RTS lights for an incoming signal on V.35 pin C. CD lights for an incoming signal on the line side, and the resulting output signal on V.35 pin F.

5.2 POWER-UP / SYNCHRONIZATION

Apply AC power to the Model 1180/35 by plugging the separate AC power adapter first into the rear panel outlet of the Model 1180/35 and then into an acceptable AC power outlet. There is no power switch on the Model 1180/35: When the "power" LED is glowing steady, the Model 1180/35 is powered up. **Note: be sure the front panel toggle switch on both Model 1180/35s is set to NORMAL.**

After both the local and remote 1180/35s are powered up, a synchronization process must occur between the two modems before a link can be established. Depending upon a number of factors, this synchronization process can take *as long as 60 seconds*. Any time one of the Model 1180/35s loses power (in a lightning storm, for example), the local and remote units *must re-synchronize* before they can resume data transmission. Note: If your application cannot tolerate a 60 second synchronization phase, **turning the front panel "Test Modes" switch to REMOTE and then back to NORMAL will synchronize the units within 250 mS.**

When both Model 1180/35s are powered up and passing data *normally*, the following LED conditions will exist:

- PWR = green
- TD & RD = flashing red and green
- RTS & DCD = green
- TEST = off

5.3 LOOPBACK TEST MODES

The Model 1180/35 offers two loopback test modes to evaluate the condition of the modems and the communication link. These tests are activated from the front panel.

5.3.1 LOCAL LOOPBACK

The local loopback test checks the operation of the local Model 1180/35, and is performed separately on each unit. Any data sent to the local Model 1180/35 in this test mode will be echoed back to the user device. For example, characters typed on the keyboard of a terminal will appear on the terminal screen.

To perform a local loopback test, follow these steps:

- A. Activate local loopback by moving the front panel toggle switch DOWN to "Local". Once local loopback is activated, the Model 1180/35 transmit output is connected to its own receiver. The "test" LED should glow. (Note: Even though the local Model 1180/35 cannot communicate with the remote Model 1180/35 in this mode, the synchronized connection between the two modems remains intact).
- B. Verify that the data terminal equipment is operating properly and can be used for a test. If a fault is indicated, call a technician or replace the unit.
- C. Perform a BERT (bit error rate) test on each unit. If the BERT test equipment indicates no faults and the data terminal indicates a fault, follow the manufacturer's checkout procedures for the data terminal. Also check the V.35 interface cable between the terminal and the Model 1180/35.

5.3.2 REMOTE LOOPBACK

The remote loopback test checks the performance of the local and remote Model 1180/35s, *and* the communication link between them (see figure 7, on the following page). Any characters sent to the remote 1180/35 in this test mode will be returned back to the originating device. For example, characters typed on the keyboard of the local terminal will appear on the local terminal screen *after* having been passed to the remote Model 1180/35 and looped back. To perform a remote loopback test, follow these steps:

- A. Activate remote loopback by moving the front panel toggle switch UP to "Remote". The "test" LED should glow.
- B. Perform a BERT (bit error rate) test on the system.
- C. If the BERT test equipment indicates a fault, and the local loopback test was successful for both Model 1180/35s, there may be a problem with the fiber communication line connecting the modems. You should test the fiber line for proper connections and continuity.

(continued)

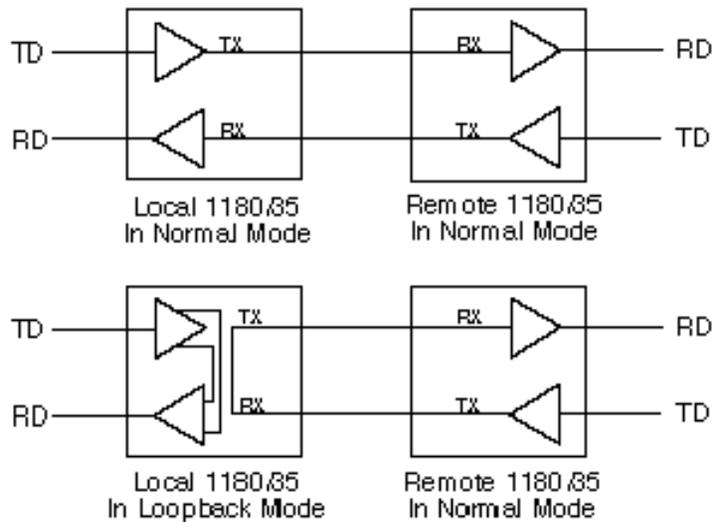


Figure 7. Local and Remote Loopback Test Modes

5.4 POWER-DOWN

Turn off the Model 1180/35 by simply unplugging the AC power adapter from the wall. There is no power switch on the Model 1180/35.

APPENDIX A TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION
LEDs do not light when AC power transformer is plugged into wall	1. Loose power connection	1. Make sure the AC connection is flush
	2. Outlet is defective	2. Try a different outlet
	3. AC power cord is defective	3. Remove the cord from the outlet and check for continuity
	4. AC transformer is not plugged into the Model 1180/35	4. Have another cup of coffee!
Carrier Detect (CD) LED is low or Carrier Detect (CD) LED is high, but 1180/35s are not communicating	1. If CD is low, possible synchronization loss	1. Check for ongoing power loss or break in fiber if CD does not go high within 60 seconds
	2. Test Mode switch is in the wrong position	2. Be sure the Test Mode switch is set to NORMAL on both Model 1180/35s
	3. DIP switches are set improperly	3. Check all DIP switch settings, esp. Reset and Data Rate , against those in Section 3; make sure both 1180/35s are set the same way
	4. Fiber link is connected improperly	4. Check the ST or SMA connection on the back of both 1180/35s
	5. V.35 connections are faulty or cables are pinned wrong	5. Check V.35 cable continuity and pinning

SYMPTOM	PROBLEM	SOLUTION
Data passes, but hardware flow control doesn't work	1. Incorrect DIP switch setting	1. Switch 7 must be in the ON condition for hardware flow control signals to pass between 1180/35s; both units must be set the same way
1180/35s work in async. mode, but not sync. mode	1. Incorrect DIP switch setting	1. Switch 8 (internal/external clock) must be set the same way for both 1180/35s

APPENDIX B

PATTON MODEL 1180/35 SPECIFICATIONS

Transmission Format:	Synchronous
Range:	1.5 miles at all data rates, 3 miles at specified data rates
Data rates:	2.4, 9.6, 14.4, 19.2, 28.8, 48, 38.4, 56, 64, 128, 144, 192 and 256 Kbps
Interface:	ITU/CCITT V.35 (M/34 female)
Transmit Mode:	Single 62.5 or 50 μ core, multi-mode fiber cable
Clocking:	Internal, external or received recovered
Handshaking:	Software (X-ON/X-OFF) or hardware (RTS/CTS), both modes available at all times
Application:	Point-to-point
Typical Link Budget:	8 dB with a 50 μ cable; 12 dB with a 62.5 μ cable
Responsivity Minimum:	0.12 A/w
LED Indicators:	TD, RD, RTS, CTS, power, test
Diagnostics:	Local and remote loopback
Fiber Connector:	ST or SMA
DTE Connector:	M/34 female
Dimensions:	4.127"w x 1.52"h x 5.0"l
Power Supply:	Wall-mount, 7.5VDC

APPENDIX C

INTERFACE PIN ASSIGNMENT

MODEL 1180/35 - FEMALE M/34 CONNECTOR (V.35)

<u>Pin #</u>	<u>Signal</u>
A	Frame Ground
B	SGND (Signal Ground)
C	RTS
D	CTS
E	DSR
F	CD
H	DTR
L	LL (Local Loop)
M	TM (Test Mode)
N	RL (Remote Loop)
P	TD
R	RD
S	TD/
T	RD/
U	XTC
V	RC
W	XTC/
X	RC/
Y	TC
AA	TC/