

USER MANUAL

MODEL 2190
V.90 Analog Modem



PE PATTON
Electronics Co.



An ISO-9001
Certified Company

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

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 2190 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 2190 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. The Model 2190 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 the Model 2190 does cause interference to radio or television reception, which can be determined by disconnecting the unit, 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 European Union (EU). A Certificate of Compliance is available by contacting Technical Support.

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) 975-1000.

1.3 FCC INFORMATION

The Model 2190 has been tested and registered in compliance with the specifications in Part 68 of the FCC rules. A label on the equipment bears the FCC registration number. You may be requested to provide this information to your telephone company.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper operation of the Model 2190. If this happens, the telephone company should give you advance notice to prevent the interruption of your service.

The telephone company may decide to temporarily discontinue your service if they believe your Model 2190 may cause harm to the telephone network. Whenever possible, they will contact you in advance. If you elect to do so, you have the right to file a complaint with the FCC.

If you have any trouble operating the Model 2190, please contact Patton Technical Support at (301) 975-1000. The telephone company may ask you to disconnect the equipment from the telephone network until the problem has been corrected or until you are certain that the Model 2190 is not malfunctioning.

1.4 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**
email: **support@patton.com**
www: **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 Model 2190. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

2.1 FEATURES

- Data modem
 - ITU-T V.90 and K56flex (56Kbps) V.34 (33.6kbps), V.32bis, V.32, V.22bis, V.22, V.23, and V.21; Bell 212A and 103.
 - V.42 LAPM, MNP2-4, and MNP 10 error correction.
 - V.42bis and MNP5 data compression
 - MNP 10ECTM enhanced cellular performance.
- Fax modem send and receive rates up to 14400 bps.
 - ITU-T V.17, V.29, V.27 ter, and V.21 channel 2.
- V.80 synchronous access modes supports host-based communication protocols.
- Voice/TAM mode (V, SP, and SVD models)
- Full-duplex speakerphone (FDSP) mode (SP and SVD models)
- Compatible with AT command sets.
- NVRAM directory and stored profiles.
- Flow control and speed buffering.
- Automatic format/speed sensing.

2.2 PACKAGE CONTENTS

Carefully unpack the Model 2190 package that you have received. The following is a checklist of the package:

- One Modem
- One RJ-11 telephone cable
- One user's manual
- Communication Software
- One AC adapter
- One RS-232 cable

3.0 INSTALLATION

The Model 2190 is equipped with one RS-232 Serial Port, two RJ-11 connectors, 2 jack hook-ups (1 microphone, 1 speakerphone), 1 AC power source and a power switch. Figure 1 below, shows the rear panel of the Model 2190 and the location of these connectors. Following figure 1 are sections describing proper installation of each connector.

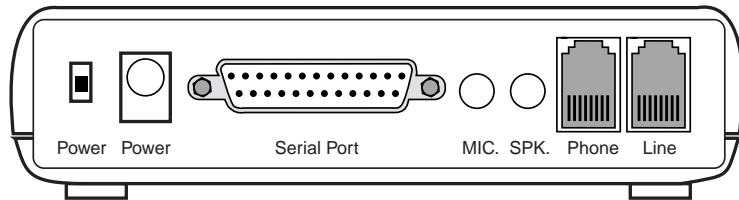


Figure 1. Model 2190 Rear Panel Connectors

3.1 CONNECTING TO THE SERIAL PORT

The serial port on the Model 2190 is a RS-232 port. Use the supplied cable to connect to the modem, the computer, or terminal.

3.2 CONNECTING TO THE PHONE LINES

On the Model 2190 there are two phone lines (jacks). The "Line" jack is for the user to connect to the public telephone line.

The "phone" jack is for the user to connect to the telephone set. You can use the telephone set, when the modem is not connected to another modem.

3.3 CONNECTING TO THE MICROPHONE (MIC)

The external microphone (MIC) jack is valid only when the voice option is selected.

3.4 CONNECTING TO THE SPEAKER (SPKR)

The External speaker (SPKR) jack.

3.5 CONNECTING POWER

The power source input. Put the other end into the wall outlet of the AC power source.

3.6 POWER

Power Switch.

3.7 MODEM DRIVER

If it is required to install the Modem, use the supplied modem driver disk.

4.0 CONFIGURATION

Before attempting to configure or operate the Model 2190, it is important to know how the unit will handle command entry. This section provides command guidelines, AT command set, dial codes, sub parameter definitions, fax commands, and voice commands.

4.1 COMMAND GUIDELINES

- All commands must be preceded by "AT" (Attention code) except for the "A/" command and "+++" escape command.
- AT commands are not case sensitive and can be entered in lower case or uppercase characters.
- AT commands cannot be deleted by the backspace key or by the delete key.
- The Attention Code is used by the modem to determine the speed and data format of the incoming data from the DTE.
- More than one command can be entered in one command line and may be separated by space for readability.
- The command line can NOT exceed 40 characters excluding the attention code and must be ended by the ASCII character specified by S register 3.
- The default of the S register 3 is the decimal 13 -- "Carriage Return"
- A line without carriage return will be ignored.
- Commands following the AT are processed after receiving the "Carriage Return" character, and the space added for readability will be ignored.
- Any parameters following the AT command that were ignored will be treated as equal to 0.

4.2 AT COMMANDS

Refer to the following AT Command Set Chart below. This chart identifies the command function and describes the elements of the command.

AT Command Sets

Command	Description
A	Answer Command Forces the modem to go off-hook in answer mode without waiting for a ring.
A/	Repeat Last Command Repeat the last command line it executed. Not preceded with AT nor followed by pressing the [Enter] key.
Bn	Select ITU-T/BELL Mode
ATB0	Selects ITU-T operation at 300bps or 1200bps during Call Establishment . (Default)
ATB1	Selects BELL operation at 300bps or 1200bps during Call Establishment.
Dn	This command directs the modem to go on-line, dial according to the string entered and attempt to establish a connection.
En	Echo Command
ATE0	Disables command echo
ATE1	Enables command echo (Default)
Hn	Hang Up the Telephone Line
ATH0	The modem will release the line if the modem is currently on-line, and will terminate any test (AT&T) that is in progress. (Default)
ATH1	If on-hook, the modem will go off-hook and enter command mode.

AT Command Sets (continued)

Command	Description
In	Identification Command
ATI0	Reports product code "56000".
ATI1	Calculates the ROM checksum and reports the least significant byte of the checksum in decimal.
ATI2	Calculated the ROM checksum and compares it with the prestored checksum.
ATI3	Reports firmware revision (F), basic model (e.g., V34), application code (A), and interface type code (I) typically in the form VF,FFF-V34_A1.
ATI5	Reports Country Code parameter.
ATI6	Reports modem data pump model and internal code revision.
Ln	Speaker Volume Control
ATL0	Low speaker volume
ATL1	Low speaker volume (Default)
ATL2	Medium speaker volume
ATL3	Higher speaker volume
Mn	Speaker Control
ATM0	Speaker is always off.
ATM1	Speaker is on during call establishment, but off when receiving carrier. (Default)
ATM2	Speaker is always on.
ATM3	Speaker is off when receiving carrier and during dialing, but on during answering.
Nn	Set Multi- or Fix- Mode Handshake
ATN0	Automode detection is disabled.
ATN1	Automode detection is enabled. (Default)
On	Return to On-Line Mode
ATO0	Enters on-line data mode without a retrain. (Default)
ATO1	Enters on-line data mode with a retrain before returning to on-line data mode.
P	Set Pulse Dial
	This command forces pulse dialing until the next T dial modifier or T command is received.
Qn	Quiet Results Code Control
ATQ0	Enables result codes to the DTE. (Default)
ATQ1	Disables result codes to the DTE.
Sr=n	Read / Write S-Register
ATSr=n	Sets S-Register "r" to the value n.
ATS?	Reports the value of S-Register r.

AT Command Sets (continued)

Command	Description
T	Set Tone Dial This command forces DTMF dialing until the next P dial modifier or P command is received.
Vn	Result Code Form ATV0 Enables short-form (terse) result code. ATV1 Enables long-form (verbose) result code (default)
Wn	Connect Message Control ATW0 Upon connection, the modem only reports the DTE speed (e.g., CONNECT 19200). (Default) ATW1 Upon connection, the modem reports the line speed, the error correction protocol, and the DTE speed, respectively. ATW2 Upon connection, the modem reports the DCE speed (e.g., CONNECT 14400).
Xn	Extended Result Codes ATX0 The modem ignores dialtone and busy tone when dialing. Sends standard result codes when a connection is completed regardless of connection speed. ATX1 The modem ignores dialtone and busy tone. Sends extended result codes when a connection is made. ATX2 The mode ignores busy tone. Sends "NO DIALTONE" if no dialtone is detected in 5 seconds of a dial attempt. Sends extended result codes when a connection is made. ATX3 The mode ignores dial tone. Sends "BUSY" if busy tone is detected. Sends extended result codes when a connection is made. ATX4 The modem sends "NO DIALTONE" if no dialtone is detected in 5 seconds of a dial attempt. Sends "BUSY" if busy tone is detected. Sends extended result codes when a connection is made, (default)
Yn	Long Space Disconnect ATY0 Disables long space disconnect. (Default) ATY1 Enables long space disconnect.
Zn	Soft Reset and Restore Profile ATZ0 Soft reset and restore profile 0. ATZ1 Soft reset and restore stored profile 1.
&Cn	DCD Option AT&C0 DCD remains ON at all times. AT&C1 DCD follows the state of the carrier. (Default)

AT Command Sets (continued)

Command	Description
&Dn	DTR Option AT&D0 Assumes DTR ON. AT&D1 Enters command mode on detecting ON-to-OFF transition of DTR. AT&D2 Goes ON-HOOK on detecting ON-to-OFF transition of DTR. (Default) AT&D3 Resets the modem on detecting ON-to-OFF transition of DTR.
&Fn	Restore Factory Configuration (Profile) AT&F0 Restore factory configuration 0. AT&F1 Restore factory configuration 1.
&Gn	Select Guard Tone AT&G0 Disables guard tone (Default) AT&G1 Disables guard tone AT&G2 Selects 1800 Hz guard tone
&Kn	Flow Control AT&K0 Disables flow control. AT&K3 Enables RTS/CTS flow control. (Default) AT&K4 Enables XON/XOFF flow control. AT&K5 Enables transparent XON/XOFF flow control. AT&K6 Enables both RTS/CTS and XON/XOFF flow control.
&Pn	Select Pulse Dial Make/Break Ratio AT&P0 Selects 39%-61% Make/Break ratio at 10 pulses per second. (Default) AT&P1 Selects 33%-67% Make/Break ratio at 10 pulses per second. AT&P2 Selects 39%-61% Make/Break ratio at 20 pulses per second. AT&P3 Selects 33%-67% Make/Break ratio at 20 pulses per second.
&Qn	Select Sync/Async Mode AT&Q0 Selects direct asynchronous operation. AT&Q5 The modem will try to negotiate an error-corrected link. (Default) AT&Q6 Selects asynchronous operation in normal mode.
&Sn	Serial Port DSR Control Command AT&S0 DSR will remains ON at all time (Default) AT&S1 DSR will become active after answer tone has been detected and inactive after the carrier has been lost.

AT Command Sets (continued)

Command	Description
&Tn	Loop Test Functions
AT&T0	Terminates test in progress.
AT&T1	Initiates local analog loopback.
AT&T3	Initiates local digital loopback.
AT&T4	Enables digital loopback acknowledgment for remote request.
AT&T5	Disables digital loopback acknowledgment for remote request. (Default)
AT&T6	Requests a remote digital loopback (RDL).
AT&T7	Requests a remote digital loopback (RDL) with self test.
AT&T8	Initiates local analog loopback with self test.
&V	Display Current Configuration and Stored Profiles Reports the current (active) configuration, the stored (user) profiles, and the four stored telephone numbers.
&V1	Display Modem Connect Status
&Wn	Store Current Configuration
AT&W0	Stores the current configuration as profile 0.
AT&W1	Stores the current configuration as profile 1.
&Yn	Profile Selection
AT&Y0	The modem will use profile 0. (Default)
AT&Y1	The modem will use profile 1.
&Zn=m	Store Telephone Number Stores telephone number for later use n= to 3, m = dialstring.
%C	Enable/ Disable Data Compression
AT%C0	Disables data compression.
AT%C1	Enables MNP 5 data compression negotiation.
AT%C2	Enables V.42bis data compression.
AT%C3	Enables both V.42bis and MNP 5 data compression. (Default)
%En	Enable/Disable Line Quality Monitor and Auto-Retrain or Fallback/Fall Forward
AT%E0	Disables line quality monitor and auto-retrain.
AT%E1	Enables line quality monitor and auto-retrain.
AT%E2	Enables line quality monitor and fallback/fall forward. (Default)

AT Command Sets (continued)

Command	Description
\An	Select Maximum MNP Block Size
ATA0	64 characters.
ATA1	128 characters. (Default)
ATA2	192 characters.
ATA3	256 characters.
\Bn	Transmit Break to Remote Break length in 100 ms units. (Default=3.) (Non-error corrected mode only.)
AT\B1- \B9	
\Kn	Break Control
(A)	Break received from DTE while in connect state during on line mode: Enter on-line command mode, no break sent to the remote modem.
\K0	Clear data buffers and send break to remote modem.
\K1	Same as 0.
\K2	Immediately send break to remote modem.
\K3	Same as 0.
\K4	Send break to remote modem in sequence with transmitted data. (Default)
\K5	
(B)	\Bn command; received from DTE while in on line command state: Purge buffers, immediately send break to remote modem.
\K0	Purge buffers, immediately send break to remote modem.
\K1	Purge buffers, immediately send break to remote modem.
\K2	Immediately send break to remote modem..
\K3	Immediately send break to remote modem.
\K4	Send break to remote modem with data.
\K5	Send break to remote modem with data.
(C)	Break received from remote modem while in connect state during non error corrected connection: Purge buffers, immediately send break to DTE.
\K0	Purge buffers, immediately send break to DTE.
\K1	Purge buffers, immediately send break to DTE.
\K2	Immediately send break to DTE.
\K3	Immediately send break to DTE.
\K4	Send break to DTE in sequence with data.
\K5	Send break to DTE in sequence with data.

AT Command Sets (continued)

Command	Description
Wn	Operating Mode
	ATN0 Selects normal speed buffered mode.
	ATN1 Selects direct mode.
	ATN2 Selects reliable
	ATN3 Selects auto reliable (error-correction) mode.
	ATN4 Selects LAP-M error-correction mode.
ATN5 Selects MNP error-correction mode.	
Wn	Single Line Connect Message Enable
	ATV0 Connect messages are controlled by the command settings X, W, and S95.
	ATV1 Connect messages are displayed in the single line format.
+MS	Select Modulation
	This extended-format command selects the modulation and, optionally, enables or disables automode, specifies the lowest and highest connection rates, selects u-Law or A-Law code type, and enables or disables robbed bit signaling generation (server modem) or detection (client modem) using one to five subparameters. The command format is: AT+MS=<mod> ,[<automode>],[<min_rate>],[<max_rate>],[<x_law> ,[<rb_signaling>]]] <CR>

+++

The Escape Code

The Escape Code returns the modem to the command state from the online state, without releasing the telephone line.

4.3 DIAL CODES

The following chart shows the Model 2190 dial codes and dial functions.

Dial Codes

Dial Code	Dial Functions
0-9	Dialing digits 0 to 9.
*	The "star" digit. (tone dialing only)
#	The "gate" digit. (tone dialing only)
A-D	DTMF digits A,B,C, and D. Some countries may prohibit sending of these digits during dialing.
L	Re-dial last number. The modem will re-dial the last valid telephone number. The "L" must be immediately after the "D" with all the following characters ignored.
P	Select pulse dialing. pulse dial the numbers that follow until a "T" is encountered.
T	Select tone dialing. Tone dial the numbers that follow until a "P" is encountered.
R	This command will be accepted, but not acted on.
S=n	Dial the number stored in the directory (n = 0 to 3). (See AT&Zn=m)
!	Flash, the modem will go on-hook for a time defined by the value of S register 29.
W	Wait for dial tone. The modem will wait for dial tone before dialing the digits following "W". If dial tone is not detected within the time specified by S register 7 or 6, the modem will abort the rest of the sequence, return on-hook, and generate an error message.
@	Wait for silence. The modem will wait for at least 5 seconds of silence in the call progress frequency band before continuing with the next dial string parameter. If the modem does not detect these 5 seconds of silence before the expiration of the call abort timer (S register 7), the modem will terminate the call attempt with a "NO ANSWER" message. If busy detection is enabled, the modem may terminate the call with the "BUSY" result code. If answer tone arrives during execution of this parameter, the modem handshakes.
&	Wait for AT&T "bong" tone for credit card dialing tone before continuing with the dial string. If the bong is not detected within the time specified by S register 7 or 6, the modem will abort the rest of the sequence, return on-hook, and generate an error message.
,	Dial pause. The modem will pause for a time specified by S register 8 before dialing the digits following " ,".

Dial Codes (continued)

Dial Code	Dial Functions
;	Return to command state. Added to the end of a dial string, this causes the modem to return to the command state after it processes the portion of the dial string preceding the ";". This allows the user to issue additional AT commands may be placed in the original command line following the ";" and/or may be entered on subsequent command lines. The modem will enter call progress only after an additional dial command is issued without the ";" terminator. Use ATH0 to abort the dial in progress, and go back on-hook.
^	Enable calling tone. Applicable to current dial attempt only.
()	Ignored. May be used to format the dial string.
-	Ignored. May be used to format the dial string.
<space>	Ignored. May be used to format the dial string.
<i>	Invalid character. Will be ignored.
>	If enabled by country specific parameter, the modem will generate a grounding pulse on the EARTH relay output.

4.4 SUB PARAMETER DEFINITIONS

This section describes the Model 2190 sub parameters. Listed below are various modulations with the possible rates that the Model 2190 supports.

<mod>	Modulation	Possible Rates (bps)	Notes
0	V.21	300	
1	V.22	1200	
2	V.22bis	2400 or 1200	
3	V.23	1200	
9	V.32	9600 or 4800	
10	V.32bis	14400, 12000, 9600, 7200, or 4800	
11	V.34	33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400	Default
64	Bell 103	300	
69	Bell 212	1200	
74	V.FC	28800, 26400, 24000, 21600, 19200, 16800, or 14400	
<automode>	Option Selected	Notes	
0	Automode disabled		
1	Automode disabled using V.8 or multi-mode	Default	

4.5 FAX COMMANDS

The following section describes the Model 2190 fax commands. The fax commands are divided into two listings; the first list shows the fax class 1 commands, and the second list shows the fax class 2 commands. The information listed below identifies the codes and its function.

4.5.1 FAX CLASS 1 COMMANDS

+FCLASS=n	Service class
+FAE=n	Data/fax auto answer
+FRH=n	Receive data with HDLC framing
+FRM=n	Receive data
+FRS=n	Receive silence
+FTH=n	Transmit data with HDLC framing
+FTM=n	Transmit data
+FTS=n	Stop transmission and wait

4.5.2 FAX CLASS 2 COMMANDS

+FCLASS=n	Service class
+FAA=n	Adaptive answer
+FAXERR	Fax error value
+FBOR	Phase C data bit order
+FBUF?	Buffer size (read only)
+FCFR	Indicate confirmation to receive
+FCLASS=	Service class
+FCON	Facsimile connection response
+FCIG	Set the polled station identification
+FCIG:	Report the polled station identification
+FCR	Capability to receive
+FCR=	Capability to receive
+FCSI:	Report the called station ID
+FDCC=	DCE capabilities parameters
+FDCS:	Report current session
+FDCS=	Current session results

Fax Class 2 commands (continued)

+FDIS:	Report remote capabilities
+FDIS=	Current sessions parameters
+FDR	Begin or continue phase C receive data
+FDT=	Data transmission
+FDTC:	Report the polled station capabilities
+FET:	Post page message response
+FET=N	Transmit page punctuation
+FHNG	Call termination with status
+FK	Session termination
+FLID=	Local ID string
+FLPL	Document for polling
+FMDL?	Identify model
+FMFR?	Identify manufacturer
+FPHCTO	Phase C time out
+FPOLL	Indicates polling request
+FPTS:	Page transfer status
+FPTS=	Page transfer status
+FRECV?	Identify revision
+FSPL	Enable polling
+FTSI:	Report the transmit station ID

4.6 VOICE COMMANDS

This section describes the voice commands on the Model 2190. The list below provides the voice command codes and its function.

#BDR	Select baud rate (turn off autobaud)
#CLS	Select data, fax, or voice.
#MDL?	Identify model
#MFR?	Identify manufacturer
#REV?	Identify revision level
#SPK=	Speakerphone setting
#TL	Audio output transmit level
#VBQ?	Query buffer size

Voice Commands (continued)

#VBS	Bits per sample
#VBT	Beep tone timer
#VCI?	Identify compression method
#VGT	Set playback volume in the command state
#VLS	Voice line select
#VRA	Ringback goes away timer (originate)
#VRN	Ringback never came timer (originate)
#VRX	Voice receive mode
#VSD	Enable silence deletion (no function, command response only).
#VSK	Buffer skid setting
#VSP	Silence detection period (voice receive)
#VSR	Sampling rate selection
#VSS	Silence detection tuner (voice receive)
#VTD	DTMF/tone reporting
#VTM	Enable timing mark placement
#VTS	Generate tone signals

4.3 REGISTERS

This section provides information on the Model 2190 S-registers. The codes and functions to change or read registers are listed below. Also included in this section is a chart on the register codes and its function.

4.3.1 COMMANDS TO CHANGE OR READ REGISTERS

Listed below are the Model 2190 command guidelines to change or read registers. This list provides the command codes and describes the functions of the codes.

ATSn=???	Changes the value of a register. "n" = number of register ??? = new value of register in decimal
-----------------	--

Commands to Change or Read Registers (continued)

- AT = ???** Changes the value of the last referenced register.
 ??? = new value
- AT?** Displays the value of the last referenced register.
- ATSn** Points to new register.
 "n" = number of register to point
- ATSn?** Displays the contents of the register selected with n.
 "n" = number of register to point.

4.3.2 REGISTER DESCRIPTION

The Model 2190 uses registers to store configuration status. Some of the registers control only one function, but some of them are called bit mapped registers which control several functions in a single register. The chart below identifies the codes, function, default, range and units of the S-registers.

S-REGISTERS				
CODES	FUNCTIONS	DEFAULT	RANGE	UNITS
S0	Rings to Auto-Answer	0	0-255	Ring
S1	Ring Counter	0	0-255	Ring
S2	Escape Character	43	0-255	ASCII
S3	Carriage Return Character	13	0-127	ASCII
S4	Line Feed Character	10	0-127	ASCII
S5	Backspace Character	8	0-255	ASCII
S6	Wait Time for Dial Tone	2	2-255	Sec.
S7	Wait Time for Carrier	50	1-255	Sec.
S8	Pause Time for Dial Delay Modifier	2	0-255	Sec.
S9	Carrier Detect Response Time	6	1-255	.1 Sec.
S10	Carrier Loss Disconnect Time	14	1-255	.1 Sec.
S11	DTMF Tone Duration	95	50-255	.001 Sec.
S12	Escape Prompt Delay	50	0-255	.02 Sec.
S14	Bit Mapped Register	138(8Ah)		
S16	Bit Mapped Register	0		
S18	Test Timer	0	0-255	Sec.
S21	Bit Mapped Register	52(34h)		
S22	Bit Mapped Register	117(75h)		
S23	Bit Mapped Register	62(3Dh)		

Register Descriptions (continued)

S-REGISTERS				
CODES	FUNCTIONS	DEFAULT	RANGE	UNITS
S24	Sleep Inactivity Timer	0	0-255	Sec.
S25	Delay to DTR Off	5	0-255	.01 Sec.
S26	RTS to CTS Delay	1	0-255	.01 Sec.
S27	Bit Mapped Register	73(49h)		
S28	Bit Mapped Register	0		
S29	Flash Dial Modifier Timer	70	0-255	10 ms.
S30	Disconnect Inactivity Timer	0	0-255	10 Sec.
S31	Bit Mapped Register	194(C2h)		
S32	XON Character	17(11h)	0-255	ASCII
S33	XOFF Character	19(13h)	0-255	ASCII
S36	LAPM Failure Control	7		
S37	Line Connection Speed	0		
S38	Delay Before Forced Hang up	20	0-255	Sec.
S39	Bit Mapped Register	3		
S40	Bit Mapped Register	104(68h)		
S41	Bit Mapped Register	195(C3h)		
S46	Data Compression Control	138		
S48	V.42 Negotiation Control	7		
S82	LAPM Break Control	128(40h)		
S86	Call Failure Reason Code		0-255	
S91	PSTN Transmit Attenuation Level	10	0-15	dBm
S92	Fax Transmit Attenuation Level	10	0-15	dBm
S95	Result Code Message Control	0		

Register value may be stored in one of two user profiles with the &W command.

5.0 OPERATIONS

Once you have configured the Model 2190 properly. You are now ready to operate the unit. The following section describes the LED status monitors.

5.1 LED STATUS MONITORS

The Model 2190 features eight front panel LEDs. Figure 2 below shows the front panel location of each LED. Following Figure 2 is a description of each LED's function.

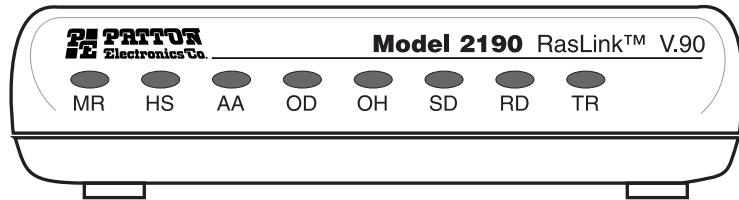


Figure 2. Model 2190 Front Panel

MR (Modem Ready):	Lights up when the power switch turned on.
HS (High Speed):	Lights up when the modem connect at 9,600bps or above.
AA (Auto Answer):	Lights up when the modem is set to Auto-Answer mode.
CD (Carrier Detect):	Lights up when the modem detects the remote carrier. It means the modem is connected.
OH (Off-Hook):	Lights up when off-hook.
SD (Send Data):	Flashes when the computer or terminal is sending data to the modem.
RD (Receive Data):	Flashes when the modem is sending data to computer or terminal.
TR (Terminal Ready):	Lights up when the computer or terminal is ready to receive data.

APPENDIX A

PATTON ELECTRONICS MODEL 2190 SPECIFICATIONS

Modulation:	Multi-dimension TCM (2400 - 56000bps), QAM & TCM (4800 - 14400bps)
Compatibility:	ITU-T V.34/V.32bis/V.32/V.22bis/V.22/V.21/V.23, Bell 103/212A, ITU-T V.90, K56flex
Operation:	Half or Full Duplex over 2-Wire PSTN
DTE Speed:	Max.: 230,400bps
Error Control:	ITU-T V.42 and MNP4
Compression:	ITU-T V.42bis and MNP5
Command Compatible:	Hayes AT Command Set
Diagnostic:	ITU-T V.54 Power On Self-Test
Flow Control:	RTS/CTS, Xon/Xoff
Retrain:	Auto- or Manual-Retrain with fall forward/fall back rate negotiation
Storage:	Maximum 4 telephone numbers and 2 user profiles
Receive Sensitivity:	-43 dBm
Fax:	ITU-T V.17/V.29/V.27ter/V.21 ch2 EIA Class 1; G3 Fax support
Voice:	Full duplex speakerphone
Terminal Interface:	EIA RS-232C D-type 25 pin connector with ITU-T V.24/V.28 recommendation
Environment:	Ambient Temperature from 0°C - 40°C Relative Humidity: from 10% to 95% non-condensing
Power Requirement:	120/230 VAC 50/60 Hz via External Transformer
Dimension:	161mm (L) X 167mm (W) X 37mm (H)

APPENDIX B

PATTON ELECTRONICS MODEL 2190
RESULT CODES

<u>SHORT FORM</u>	<u>LONG FORM</u>
0	OK
1	Connect
2	Ring
3	No Carrier
4	Error
5	Connect 1200
6	No Dial Tone
7	Busy
8	No Answer
10	Connect 2400
11	Connect 4800
12	Connect 9600
13	Connect 14400
14	Connect 19200
18	Connect 57600
22	Connect 1200/75
23	Connect 75/1200
24	Connect 7200
25	Connect 12000
28	Connect 38400
31	Connect 115200
33	Fax
35	Data
45	Ring Back
59	Connect 16800
61	Connect 21600
62	Connect 24000
63	Connect 26400
64	Connect 28800
84	Connect 33600
91	Connect 31200

APPENDIX B

PATTON ELECTRONICS MODEL 2190
RESULT CODES
(continued)

<u>SHORT FORM</u>	<u>LONG FORM</u>
180	Connect 28000
181	Connect 29333
182	Connect 30667
165	Connect 32000
183	Connect 33333
184	Connect 34667
185	Connect 37333
186	Connect 38667
169	Connect 40000
187	Connect 41333
171	Conenct 42667
189	Connect 45333
190	Connect 46667
173	Connect 48000
191	Connect 49333
192	Connect 50667
175	Connect 52000
193	Connect 53333
194	Connect 54667
177	Connect 56000
+F4	+FCERROR
See Note	Connect (DTE data rate) (modulation)/(error correc- tion)(data compression) /TX: (DCE transmit data rate)/RX: (DCE receive data rate)

APPENDIX C

PATTON ELECTRONICS MODEL 2190
RS-232 (ITU-T V.24/V.28) PIN ASSIGNMENTS

<u>PIN</u>	<u>V.24</u>	<u>FUNCTIONS</u>	<u>SIGNALS</u>	<u>DIRECTION</u>
1		Frame Ground	FG	
2	103	Transmitted Data	TxD	Input
3	104	Received Data	RxD	Output
4	105	Request to Send	RTS	Input
5	106	Clear to Send	CTS	Output
6	107	Data Set Ready	DSR	Output
7	102	Signal Ground	SG	
8	109	Carrier Detect	CD	Output
20	108.2	Data Terminal Ready	DTR	Input
22	125	Ring Indicator	RI	Output