Telenetics

Modems

MOT202T

"Born-Again"
UDS/Motorola 202T

▲ 2-wire half duplex or 4-wire full duplex
  private line operation

▲ 0 to 1200 bps data rate over unconditional
  lines and 1800 over high quality lines

▲ Anti-streaming

▲ Phase coherent, frequency shift keyed
  (FSK) modulation

▲ LED indicators

▲ Front panel rotary switch function selector

▲ Integral test features

▲ 12, 24, 48, 125VDC Power (Rack)

▲ 115VAC, 60Hz - 220/240VAC 50 Hz
  power (Standalone)

Introducing the latest addition to the Telenetics®
family of industrial grade, temperature hardened
modems, the MOT202T is a pin-for-pin, form, fit
and function replacement for the Motorola/UDS
Model RM16M202T.

A must for industrial applications, the MOT202T
(Standalone) features built-in diagnostic, anti-
streaming, multi-power inputs (115 to 240AC, 12 to
125VDC) and -40°C to +80°C operating range capabilities.

The modem operates over leased or dedicated, loaded
or unloaded lines equal to or better than the ITU
(formerly CCITT) M.1020/1025 or the BELL 3002 leased
line services. It operates over point-to-point or
multi-point polled systems and operates in full or
half-duplex over 4-wire or 2-wire circuits.

The modem employs circuitry to prevent data and carrier detect errors over noisy lines. In multi-drop systems
it is very common to have noise spikes and other harmful high frequency components caused by carrier turn-offs
from other modems on the same line. The modem uses a combination of soft-carrier generation and soft-carrier
detection in conjunction with a signal to noise ratio (SNR) detector to eliminate errors caused by line noise.

The MOT202T's anti-streaming capability prevents a modem from remaining in the transmit mode when the modem is
not actively transmitting date. In addition, the MOT202T allows users to verify transmitted and received data
via the diagnostic feature.

The MOT202T interchangeable design between the Universal Data Shelf multiple modem enclosure (RM16M series)
and the standalone modem enclosure, enables the modem to be directly inserted in the Universal Data Shelf when
the optional front panel is attached. Thus, data-communications facility can easily upgrade from front
multiple standalone enclosures to a centralized rack without the expense and trouble of purchasing new modems.

Specifications*

FUNCTIONAL DESCRIPTION

General

Data Rate	From 0 to 1800 bps (baud) depending on transmission facility
Modulation	Phase-coherent Frequency shift keying (FSK).
Line Impedance	600 ohms ± 10 %, transformer coupled and transient protected
Operation	The modem operates at full duplex or half duplex over four-wire lines, or half-duplex only over two-wire lines. It operates asynchronously.

Receive and Transmit Frequencies		
	Space:	2200 Hz
	Mark:	1200 Hz
	Soft carrier:	900 Hz

Timings	All settings and timings are controlled by jumpers on the modem board.
Anti-streaming	Option to turn transmitter OFF after a selected time, even if Request To Send is ON
Test Features	The modem employs a rotary switch that selects these test options:

· Data Mode
· Self Test
· Analog Loop back
· Digital Loop back
· Test Pattern Transmit

Indicators	The modem has LED indicators for the following interface circuits:

RTS, CTS, DCD, RD, TD, TM (Test Mode) and PWR.

Receiver

Receiver Center Frequency Tolerance	1700Hz ± 16 Hz
Receiver Performance	The modem receiver will operate with the following performance at 3002/C2 or M1025 lines
1200Bps:	B.E.R. equal to 1×10^{-5} with 12 db signal to noise ratio
1800Bps:	B.E.R. equal to 1×10^{-5} with 18 db signal to noise ratio
Carrier Detect Threshold	The received carrier detect threshold can be configured by the on-board jumper.

With jumper option:

DCD off → on	Carrier stronger than –30 dBm

OR

DCD off → on	Carrier stronger than –45 dBm
Hysteresis:	Approximately 2 dB
Receiver Dynamic Range	0 dBm to – 43 dBm

Transmitter

Transmit Frequency Tolerances	Space frequency:	± 0.1 %
	Mark frequency:	± 0.1 %
	Soft Carrier frequency:	± 0.1 %
Transmit Levels	The modem transmit level is selectable from 0 dBm to – 14 dBm in 2 dB steps by the on-board jumper S2-1 to 8.	

POWER REQUIREMENTS

Rack & Standalone

AC Power	20 VAC RMS @ 150 mA, centertapped. 10 VAC RMS @ 225 mA. 115VAC & 220/240VAC
DC Power	+15 VDC referred to gnd -15 VDC referred to gnd. +8.5 VDC referred to gnd.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-40 to + 85 degrees C
Storage Temperature	-40 to + 85 degrees C
Relative Humidity	95%, non-condensing

INTERFACE SPECIFICATIONS

Analog Line edge connector	An 8-pin edge connector located at the backend of the modem board. The four signals routed to and from this connector are the analog transmit and receive pairs. Each pair are fully differential signals.

Pin	Signal Name	Function
3	DTR	Receive Line for four wire systems
4	DTX	Transmit/Receive Line for two wire systems
5	DRX	Transmit/Receive Line for two wire systems
6	DRR	Receive Line for four wire systems

The maximum data rate for this modem is:

▲ 0 to 1200 bps (baud) over ITU M.1025 or BELL 3002 Basic services.

▲ 0 to 1800 bps (baud) over ITU M.1020 or BELL 3002 C2 conditioned lines.

Interface Compatibility

▲ The modem's line interface is compatible with the Bell Systems/WE 202 specifications and with the ITU V.23 recommendation.

▲ The modem's data interface is compatible with the RS 232C specifications and with the ITU V.24/28 recommendations.

Power edge connector — A 12-pin edge connector located at the left side of the modem board. This connector supplies the modem board with power from the standalone case or the modem rack. Header H1 is located on top of P1.

Pin	Voltage	Function	Header H1 Pin
10	+ 15 VDC	Transformer 20 VAC	2
12	- 15 VDC	Transformer 20 VAC	1
8	Center Tap	Transformer center tap	3 & 4
4	+ 8.5 VDC	Transformer 10 VAC	6
6	+ 8.5 VDC	Transformer 10 VAC	5
2	GND	Chassis Ground	n.c.

Digital Data edge connector — P2 is a 25-pin edge connector located at the backend of the modem board. The eleven signals routed to and from this connector are the RS 232 data interface signals.

Pin	RS 232 circuit	V.24 circuit	Function
1	AA	101	Protective Ground
2	BA	103	Transmitted Data
3	BB	104	Received Data
4	CA	105	Request To Send
5	CB	106	Clear To Send
6	CC	107	Data Set Ready
7	AB	102	Signal Ground
8	CF	109	Data Carrier Detect
9	----	----	+ 12 Volt.Test only
10	----	----	- 12 Volt.Test only
25	----	----	Analog Loop back

Modem Board Selective Jumper Options

Operational Settings

Data Carrier Detect Level
- 30 dBm
- 45 dBm

Transmit Level
| 0 dBm |
| - 2 dBm |
| - 4 dBm |
| - 6 dBm |
| - 8 dBm |
| - 10 dBm |
| - 12 dBm |
| - 14 dBm |

Line Connection
| 2- wire |
| 4- wire |

Turnaround Squelch
| In |
| Out |

Transmit Carrier
| RTS Control |
| Constant Carrier |

Local Copy Squelch
| No Local Copy |
| Local Copy |

Test Generator Baud rate
| 1 |
| 18 |
| 37 |
| 75 |
| 150 |

Chassis GND Option
| Chassis GND and Signal GND not connected |
| Chassis GND and Signal GND connected together |

Modem Timing

RTS/CTS Delay
| 8 ms |
| 33 ms |
| 59 ms |
| 219 ms |

Data Carrier Detect Delay
| 6 ms |
| 23 ms |

Turnaround Squelch Time
| 83 ms |
| 159.6 ms |

Soft Carrier Timing
| No Soft Carrier |
| 8.3 ms |
| 26.6 ms |

Anti-Streaming Time
| 4 ms |
| 7.6 ms |
| 14 ms |
| 28 ms |
| 56 ms |
| Out |

*Specifications are subject to change without notice

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