Remote Operations

For the DMD20/DMD50/DMD2050/DMD2050E/DMD1050/OM20 Manuals

Part Number MN-DMDREMOTEOP
Revision 9

IMPORTANT NOTE: The information contained in this document supersedes all previously published information regarding this product. This manual is subject to change without prior notice.

Comtech EF Data, 2114 West 7th Street, Tempe, Arizona 85281 USA, 480.333.2200, FAX: 480.333.2161

Table of Contents

Preface

About this Manual

This manual describes the installation and operation for the Radyne DMD Remote Operations. This is a technical document intended for earth station engineers, technicians, and operators responsible for the operation and maintenance of the Radyne DMD Remote Operations.

Patents and Trademarks

See all of Comtech EF Data's Patents and Patents Pending at http://patents.comtechefdata.com.

Comtech EF Data acknowledges that all trademarks are the property of the trademark owners.

Product Support

For all product support, please call:

+1.240.243.1880

+1.866.472.3963 (toll free USA)

Military Standards

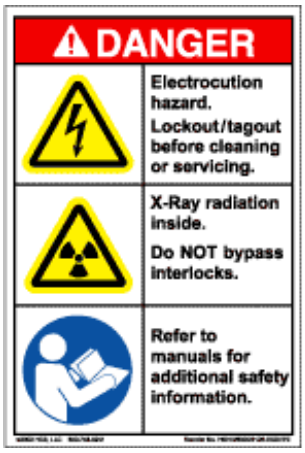
References to "MIL-STD-188" apply to the 114A series (i.e., MIL-STD-188-114A), which provides electrical and functional characteristics of the unbalanced and balanced voltage digital interface circuits applicable to both long haul and tactical communications. Specifically, these references apply to the MIL-STD-188-114A electrical characteristics for a balanced voltage digital interface circuit, Type 1 generator, for the full range of data rates. For more information, refer to the Department of Defense (DOD) MIL-STD-188-114A, *Electrical Characteristics of Digital Interface Circuits*.

Related Documents

- Department of Defense (DOD) MIL-STD-188-114A*, Electrical Characteristics of Digital Interface Circuits*
- Department of Defense (DOD) MIL-STD-188-165A, *Interoperability and Performance Standards for SHF Satellite Communications PSK Modems (FDMA Operation)* (dated November 2005)
- *INTELSAT Earth Station Standards IESS-308, -309, -310, and -315*
- *EUTELSAT SMS*

Safety Compliance

Examples of Multi-Hazard Formats



EN 60950

Applicable testing is routinely performed as a condition of manufacturing on all units to ensure compliance with the requirements of the **EN 60950 Safety of Information Technology Equipment (Including Electrical Business Machines)** safety standard.

This equipment meets the Safety of Information Technology Equipment specification as defined in EN60950.

Low Voltage Directive (LVD)

The following information is applicable for the European Low Voltage Directive (2006/95/EC):

Symbol	Description
<HAR>	Type of power cord required for use in the European Community.
⚠	**CAUTION:** Double-pole/Neutral Fusing **ACHTUNG:** Zweipolige bzw. Neutralleiter-Sicherung

International Symbols			
Symbol	**Definition**	**Symbol**	**Definition**
~	Alternating Current	⏚	Protective Earth
▭	Fuse	⏚	Chassis Ground

Warranty Policy

Comtech EF Data products are warranted against defects in material and workmanship for a specific period from the date of shipment, and this period varies by product. In most cases, the warranty period is two years. During the warranty period, Comtech EF Data will, at its option, repair or replace products that prove to be defective. Repairs are warranted for the remainder of the original warranty or a 90 day extended warranty, whichever is longer. Contact Comtech EF Data for the warranty period specific to the product purchased.

For equipment under warranty, the owner is responsible for freight to Comtech EF Data and all related customs, taxes, tariffs, insurance, etc. Comtech EF Data is responsible for the freight charges only for return of the equipment from the factory to the owner. Comtech EF Data will return the equipment by the same method (i.e., Air, Express, Surface) as the equipment was sent to Comtech EF Data.

All equipment returned for warranty repair must have a valid RMA number issued prior to return and be marked clearly on the return packaging. Comtech EF Data strongly recommends all equipment be returned in its original packaging.

Comtech EF Data Corporation's obligations under this warranty are limited to repair or replacement of failed parts, and the return shipment to the buyer of the repaired or replaced parts.

Limitations of Warranty

The warranty does not apply to any part of a product that has been installed, altered, repaired, or misused in any way that, in the opinion of Comtech EF Data Corporation, would affect the reliability or detracts from the performance of any part of the product, or is damaged as the result of use in a way or with equipment that had not been previously approved by Comtech EF Data Corporation.

The warranty does not apply to any product or parts thereof where the serial number or the serial number of any of its parts has been altered, defaced, or removed.

The warranty does not cover damage or loss incurred in transportation of the product.

The warranty does not cover replacement or repair necessitated by loss or damage from any cause beyond the control of Comtech EF Data Corporation, such as lightning or other natural and weather related events or wartime environments.

The warranty does not cover any labor involved in the removal and or reinstallation of warranted equipment or parts on site, or any labor required to diagnose the necessity for repair or replacement.

The warranty excludes any responsibility by Comtech EF Data Corporation for incidental or consequential damages arising from the use of the equipment or products, or for any inability to use them either separate from or in combination with any other equipment or products.

A fixed charge established for each product will be imposed for all equipment returned for warranty repair where Comtech EF Data Corporation cannot identify the cause of the reported failure.

Exclusive Remedies

Comtech EF Data Corporation's warranty, as stated is in lieu of all other warranties, expressed, implied, or statutory, including those of merchantability and fitness for a particular purpose. The buyer shall pass on to any purchaser, lessee, or other user of Comtech EF Data Corporation's products, the aforementioned warranty, and shall indemnify and hold harmless Comtech EF Data Corporation from any claims or liability of such purchaser, lessee, or user based upon allegations that the buyer, its agents, or employees have made additional warranties or representations as to product preference or use.

The remedies provided herein are the buyer's sole and exclusive remedies. Comtech EF Data shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

Comtech EF Data Headquarters

http://www.comtechefdata.com
Comtech EF Data Corp.
2114 West 7th Street
Tempe, Arizona USA 85281
+1.480.333.2200

Chapter 1. Remote Operations

1.1 Introduction

The Remote Protocols for the DMD20, DMD20LBST, DMD50, DMD2050, DMD2050E, DMD1050 and OM20 are similar in design and utilize the same protocol platforms. This document should be used as the primary source for identifying the various protocol structures and control menus for products listed below. The most current Remote Protocols manual can be accessed from the Radyne web site at http://www.comtechefdata.com

The Remote Protocols identified in MN-DMDREMOTEOP are RLLP (Radyne Link Level Protocol), SNMP MIB file, Web Browser menus and Terminal Port menus. The MN-DMDREMOTEOP document does not identify equipment setup processes. The Product manuals include instructions to set up the equipment but will not include the protocol structure. The Remote Protocol manual MN-DMDREMOTEOP is applicable to the following products:

Equipment	Manual
DMD20	MN-DMD20/20LBST
DMD20LBST	MN-DMD20/20LBST
DMD50	MN-DMD50
DMD2050	MN-DMD2050
DMD2050E	MN-DMD2050E
DMD1050	MN-DMD1050
OM20	MN-OM20

1.2 Modem Remote Communications (RLLP):

The Remote Port allows for complete control and monitoring of all parameters and functions via an RS-232 Serial Interface or RS-485 for RLLP Protocol. 'Equipment Remote Mode' can be entered from the GUI interface under the "System" menu by selecting "System" and then "Terminal" followed by "Terminal". The baud rate and evaluation type can be changed at the front panel by using the *System>Baud Rate* Menu.

Control and status messages are conveyed between the modem and all subsidiary modems and the host computer using packetized message blocks in accordance with a proprietary communications specification. This communication is handled by the Radyne Link Level Protocol (RLLP), which serves as a protocol 'wrapper' for the RM&C data. Complete information on monitor and control software is contained in the following sections.

NOTE

This specification is applicable to the DMD20/20LBST, DMD50, DMD2050, DMD2050E, DMD1050 and OM20 Modems. Any reference to the DMD20 in this document can be applicable to any one of these three modems.

For configuration setup, refer to the product manuals.

1.2.1 Protocol Structure:

The Communications Specification (COMMSPEC) defines the interaction of computer resident Monitor and Control Software used in satellite earth station equipment such as modems, redundancy switches, multiplexers, and other ancillary support gear. Communication is bi-directional, and is normally established on one or more full-duplex 9600-baud multi-drop control buses that conform to EIA Standard RS-485.

Each piece of earth station equipment on a control bus has a unique physical address, which is assigned during station setup/configuration or prior to shipment. Valid decimal addresses on one control bus range from 032 through 255 for a total of up to 224 devices per bus. Address 255 of each control bus is usually reserved for the M&C computer.

1.2.2 Protocol Wrapper:

The Radyne COMMSPEC is byte-oriented, with the Least Significant Bit (LSB) issued first. Each data byte is conveyed as mark/space information with two marks comprising the stop data. When the last byte of data is transmitted, a hold comprises one steady mark (the last stop bit). To begin or resume data transfer, a space (00h) substitutes this mark. This handling scheme is controlled by the hardware and is transparent to the user. A pictorial representation of the data and its surrounding overhead may be shown as follows:

S1	S2	B_0	B_1	B_2	B_3	B_4	B_5	B_6	B_7	S1	S2, etc.

The Stop Bits, S1 and S2, are each a mark. Data flow remains in a hold mode until S2 is replaced by a space. If S2 is followed by a space, it is considered a start bit for the data byte and not part of the actual data (B_0 - B_7). The COMMSPEC developed for use with the Radyne Link Level Protocol (RLLP) organizes the actual monitor and control data within a shell, or 'protocol wrapper' that surrounds the data. The format and structure of the COMMSPEC message exchanges are described herein. Decimal numbers have no suffix; hexadecimal numbers end with a lower case 'h' suffix and binary values have a lower case 'b' suffix. Thus, 22 = 16h = 000010110b. The principal elements of a data frame, in order of occurrence, are summarized as follows:

<SYNC>: The message format header character or ASCII sync character that defines the beginning of a message. The <SYNC> character value is always 16h.

<BYTE COUNT>: The Byte Count is the number of bytes in the <DATA> field (2 Bytes).

<SOURCE ID>: The Source Identifier defines the multi-drop address origin.

NOTE

All nodes on a given control bus have a unique address that must be defined.

<DESTINATION ID>: The Destination Identifier serves as a pointer to the multi-drop destination device that indicates where the message is to be sent.

<FRAME SEQUENCE NUMBER>: The Frame Sequence Number (FSN) is a tag with a value from 0 through 255 that is sent with each message. It assures sequential information framing and correct equipment acknowledgment and data transfers.

<OPCODE>: The Operation Code field contains a number that identifies the message type associated with the data that follows it. Equipment under MCS control recognizes this byte via firmware identification and subsequently steers the DATA accordingly to perform a specific function or series of functions. Acknowledgment and error codes are returned in this field (2 Bytes).

<DATA>: The Data field contains the binary, bi-directional data bytes associated with the <OPCODE>. The number of data bytes in this field is indicated by the <BYTE COUNT> value.

<CHECKSUM>: The checksum is the modulo 256 sum of all preceding message bytes, excluding the <SYNC> character. The checksum determines the presence or absence of errors within the message. In a message block with the following parameters, the checksum is computed as shown in Table 1-1.

BYTE FIELD	DATA CONTENT	RUNNING CHECKSUM
<BYTE COUNT> (BYTE 1)	00h = 00000000b	00000000b
<BYTE COUNT> (BYTE 2)	04h = 00000100b	00000100b
<SOURCE ID>	FFh = 11111111b	00000011b
<DESTINATION ID>	20h = 00100000b	00100011b
<FSN>	09h = 00001001b	00101100b
<OPCODE> (BYTE 1)	2Ah = 00101010b	01010110b
<OPCODE> (BYTE 2)	01h = 00000001b	01010111b
<DATA> (Byte 1)	08h = 00001000b	01011111b
<DATA> (Byte 2)	58h = 01011000b	10110111b
<DATA> (Byte 3)	3Bh = 00111011b	11110010b
<DATA> (Byte 4)	00h = 00000000b	11110010b

Table 1-1: Checksum Calculation Example

Thus, the checksum is 11110010b; which is F2h or 242 decimal. Alternative methods of calculating the checksum for the same message frame are:

00h + 04h + FFh + 20h + 09h + 2Ah + 01h + 08h + 58h + 3Bh + 00h = 1F2h.

Since the only concern is the modulo 256 (modulo 1 00h) equivalent (values that can be represented by a single 8-bit byte), the checksum is F2h. For a decimal checksum calculation, the equivalent values for each information field are:

0 + 4 + 255 + 32 + 9 + 42 + 1 + 8 + 88 + 59 + 0 = 498;

498/256 = 1 with a remainder of 242.

This remainder is the checksum for the frame.

242 (decimal) = F2h = 11110010b = <CHECKSUM>

1.2.3 Frame Description and Bus Handshaking:

In a Monitor and Control environment, every message frame on a control bus port executes as a packet in a loop beginning with a wait-for-SYNC-character mode. The remaining message format header information is then loaded, either by the M&C computer or by a subordinate piece of equipment (such as the DMD20) requesting access to the bus. Data is processed in accordance with the OPCODE, and the checksum for the frame is calculated. If the anticipated checksum does not match, then a checksum error response is returned to the message frame originator. The entire message frame is discarded and the wait-for-SYNC mode goes back into effect. If the OPCODE resides within a command message, it defines the class of action that denotes an instruction that is specific to the device type, and is a prefix to the DATA field if data is required. If the OPCODE resides within a query message packet, then it defines the query code, and can serve as a prefix to query code DATA.

The Frame Sequence Number (FSN) is included in every message packet and increments sequentially. When the M&C computer or bus-linked equipment initiates a message, it assigns the FSN as a tag for error control and handshaking. A different FSN is produced for each new message from the FSN originator to a specific device on the control bus. If a command packet is sent and not received at its intended destination, then an appropriate response message is not received by the packet originator. The original command packet is then re-transmitted with the same FSN. If the repeated message is received correctly at this point, it is considered a new message and is executed and acknowledged as such.

If the command packet is received at its intended destination but the response message (acknowledgment) is lost, then the message originator (usually the M&C computer) re-transmits the original command packet with the same FSN. The destination device detects the same FSN and recognizes that the message is a duplicate, so the associated commands within the packet are not executed a second time. However, the response packet is again sent back to the source as an acknowledgment in order to preclude undesired multiple executions of the same command.

To reiterate, valid equipment responses to a message require the FSN tag in the command packet. This serves as part of the handshake/acknowledges routine. If a valid response message is absent, then the command is re-transmitted with the same FSN. For a repeat of the same command involving iterative processes (such as increasing or decreasing the transmit power level of a DMD20 modulator), the FSN is incremented after each message packet. When the FSN value reaches 255, it overflows and begins again at zero. The FSN tag is a powerful tool that assures sequential information framing, and is especially useful where commands require more than one message packet.

The full handshake/acknowledgment involves a reversal of source and destination ID codes in the next message frame, followed by a response code in the <OPCODE> field of the message packet from the equipment under control.

If a command packet is sent and not received at its intended destination, a timeout condition can occur because a response message is not received by the packet originator. On receiving devices slaved to an M&C computer, the timeout delay parameters may be programmed into the equipment in accordance with site requirements by Radyne prior to shipment, or altered by qualified personnel. The FSN handshake routines must account for timeout delays and be able to introduce them as well.

1.2.4 Global Response Operational Codes:

In acknowledgment (response) packets, the operational code <OPCODE> field of the message packet is set to 0 by the receiving devices when the message intended for the device is evaluated as valid. The device that receives the valid message then exchanges the <SOURCE ID> with the <DESTINATION ID>, sets the <OPCODE> to zero in order to indicate that a good message was received, and returns the packet to the originator. This "GOOD MESSAGE" Opcode is one of nine global responses. Global response opcodes are common responses, issued to the M&C computer or to another device that can originate from and are interpreted by all Radyne equipment in the same manner. These are summarized as follows (all opcode values are expressed in decimal form):

Response OPCODE Description	OPCODE
Good Message	000d = 0000h
Bad Parameter	255d = 00FFh
Bad Opcode	254d = 00FEh
Incomplete Parameter	247d = 00F7h

Table 1-2: Response OPCODES

The following response error codes are specific to the DMD20:

DMD20 Response Error Code Descriptions	OPCODE
MPARM_FREQUENCY_ERROR	0x0401
MPARM_STRAP_ERROR	0x0402
MPARM_FILTERMASK_ERROR	0x0403
MPARM_DATARATE_ERROR	0x0404
MPARM_EXTEXCCLOCK_ERROR	0x0405
MPARM_EXTREFERENCE_ERROR	0x0406
MPARM_EXTREFSOURCE_ERROR	0x0407
MPARM_MODULATIONTYPE_ERROR	0x0408
MPARM_CONVENCODER_ERROR	0x0409
MPARM_REEDSOLOMON_ERROR	0x040A
MPARM_SCRAMBLERCONTROL_ERROR	0x040B
MPARM_SCRAMBLERTYPE_ERROR	0x040C
MPARM_DIFFERENTIALENCODER_ERROR	0x040F
MPARM_XMITPOWERLEVEL_ERROR	0x0410
MPARM_CARRIERCONTROL_ERROR	0x0411
MPARM_CARRIERSELECTION_ERROR	0x0412
MPARM_SPECTRUM_ERROR	0x0413
MPARM_TXTESTPATTERN_ERROR	0x0414
MPARM_TERRLOOPBACK_ERROR	0x0415
MPARM_BASELOOPBACK_ERROR	0x0416
MPARM_CLOCKCONTROL_ERROR	0x0417
MPARM_CLOCKPOLARITY_ERROR	0x0418
MPARM_FRAMING_ERROR	0x0419
MPARM_DROPMODE_ERROR	0x041A
MPARM_SCTSOURCE_ERROR	0x041B
MPARM_T1D4YELLOW_ERROR	0x041E
MPARM_NETWORKSPEC_ERROR	0x0422
MPARM_CIRCUITID_ERROR	0x0423
MPARM_ESCCHANNEL1VOLUME_ERROR	0x0424
MPARM_ESCCHANNEL2VOLUME_ERROR	0x0425
MPARM_INTERFACETYPE_ERROR	0x0429
MPARM_INTERFACENOTPRESENT_ERROR	0x042A

MPARM_INTERFACECOMMUNICATION_ERROR	0x042B
MPARM_SYMBOLRATE_ERROR	0x042C
MPARM_NOTIMPLEMENTED_ERROR	0x042D
MPARM_SUMMARYFAULT_ERROR	0x0430
MPARM_DATAINVERT_ERROR	0x0431
MPARM_ESCSOURCE_ERROR	0x0432
MPARM_AUPCLOCALENABLE_ERROR	0x0435
MPARM_AUPCREMOTEENABL_ERROR	0x0436
MPARM_AUPCLOCALCLACTION_ERROR	0x0437
MPARM_AUPCREMOTECLACTION_ERROR	0x0438
MPARM_AUPCTRACKINGRATE_ERROR	0x0439
MPARM_AUPCREMOTEBBLOOPACK_ERROR	0x043A
MPARM_AUPCREMOTE2047_ERROR	0x043B
MPARM_AUPCEBNO_ERROR	0x043C
MPARM_AUPCMINPOWER_ERROR	0x043D
MPARM_AUPCMAXPOWER_ERROR	0x043E
MPARM_AUPCNOMINAPOWER_ERROR	0x043F
MPARM_ASYNCBAUDRATE_ERROR	0x0452
MPARM_ASYNCDATABITS_ERROR	0x0453
MPARM_ASYNCMODE_ERROR	0x0454
MPARM_TPCINTERLEAVER_ERROR	0x0455
DPARM_NETWORKSPEC_ERROR	0x0600
DPARM_FREQUENCY_ERROR	0x0601
DPARM_SWEEPDELAY_ERROR	0x0602
DPARM_DATARATE_ERROR	0x0603
DPARM_SWEEPBOUNDARY_ERROR	0x0604
DPARM_LEVELLIMIT_ERROR	0x0605
DPARM_STRAP_ERROR	0x0606
DPARM_FILTERMASK_ERROR	0x0607
DPARM_DEMODULATIONTYPE_ERROR	0x0608
DPARM_CONVDECODER_ERROR	0x0609
DPARM_REEDSOLOMON_ERROR	0x060A
DPARM_DIFFERENTIALDECODER_ERROR	0x060B
DPARM_DESCRAMBLERCONTROL_ERROR	0x060C
DPARM_DESCRAMBLERTYPE_ERROR	0x060D
DPARM_SPECTRUM_ERROR	0x060E
DPARM_BUFFERSIZE_ERROR	0x060F
DPARM_BUFFERCLOCK_ERROR	0x0610
DPARM_BUFFERCLOCKPOL_ERROR	0x0611
DPARM_INSERTMODE_ERROR	0x0612
DPARM_T1E1FRAMESOURCE_ERROR	0x0614
DPARM_FRAMING_ERROR	0x0615
DPARM_RXTESTPATTERN_ERROR	0x0616
DPARM_MAPSUMMARY_ERROR	0x0617
DPARM_BEREXPONENT_ERROR	0x0619
DPARM_CIRCUITID_ERROR	0x061A
DPARM_TERRLOOPBACK_ERROR	0x061B
DPARM_BASELOOPBACK_ERROR	0x061C
DPARM_IFLOOPBACK_ERROR	0x061D
DPARM_INTERFACETYPE_ERROR	0x061E
DPARM_INTERFACENOTPRESENT_ERROR	0x061F
DPARM_INTERFACECOMMUNICATION_ERROR	0x0620
DPARM_SYMBOLRATE_ERROR	0x0621

DPARM_NOTIMPLEMENTED_ERROR	0x0622
DPARM_DATAINVERT_ERROR	0x0623
DPARM_SUMMARYFAULT_ERROR	0x0624
DPARM_EXTERNALEXCSOURCE_ERROR	0x0625
DPARM_ASYNCMODE_ERROR	0x062C
DPARM_ASYNCBAUDRATE_ERROR	0x062D
DPARM_ASYNCTYPE_ERROR	0x062E
DPARM_ASYNCDATABITS_ERROR	0x062F
DPARM_REACQ_SWEEP_ERROR	0x0631
DPARM_ESCCHANNEL1VOLUME_ERROR	0x0632
DPARM_ESCCHANNEL2VOLUME_ERROR	0x0633
DPARM_ESCOVERHEADTYPE_ERROR	0x0634
DPARM_TPCINTERLEAVER_ERROR	0x0635
DPARM_FASTACQENABLE_ERROR	0x0636
DPARM_RFMTIMECONSTANT_ERROR	0x0637
MDPARM_MAPNUMBER_ERROR	0x0A00
MDPARM_TIME_ERROR	0x0A01
MDPARM_DATE_ERROR	0x0A02
MDPARM_MINORALARMRELAYUSAGE_ERROR	0x0A03

1.2.5 Collision Avoidance:

When properly implemented, the physical and logical devices and ID addressing scheme of the COMMSPEC normally precludes message packet contention on the control bus. The importance of designating unique IDs for each device during station configuration cannot be overemphasized. One pitfall, which is often overlooked, concerns multi-drop override IDs. All too often, multiple devices of the same type are assigned in a direct-linked ("single-thread") configuration accessible to the M&C computer directly.

For example, if two DMD20 Modems with different addresses (DESTINATION IDs) are linked to the same control bus at the same hierarchical level, both will attempt to respond to the M&C computer when the computer generates a multi-drop override ID of 22. If their actual setup parameters, status, or internal timing differs, they will both attempt to respond to the override simultaneously with different information or asynchronously in their respective message packets and response packets, causing a collision on the serial control bus.

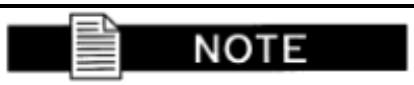
To preclude control bus data contention, different IDs must always be assigned to the equipment. If two or more devices are configured for direct-linked operation, then the M&C computer and all other devices configured in the same manner must be programmed to inhibit broadcast of the corresponding multi-drop override ID.

The multi-drop override ID is always accepted by devices of the same type on a common control bus, independent of the actual DESTINATION ID. These override IDs with the exception of “BROADCAST” are responded to by all directly linked devices of the same type causing contention on the bus. The “BROADCAST” ID, on the other hand, is accepted by all equipment but none of then returns a response packet to the remote M&C.

The following multi-drop override IDs are device-type specific, with the exception of "BROADCAST". These are summarized below with ID values expressed in decimal notation:

Directly-Addressed Equipment	Multi-Drop Override ID
Broadcast (all directly-linked devices)	00
DMD-3000/4000, 4500 or 5000 Mod Section, DMD20	01
DMD-3000/4000, 4500 or 5000 Demod Section, DMD20	02

RCU-340 1:1 Switch	03
RCS-780 1:N Switch	04
RMUX-340 Cross-Connect Multiplexer	05
CDS-780 Clock Distribution System	06
SOM-340 Second Order Multiplexer	07
DMD-4500/5000 Modulator Section	08
DMD-4500/5000 Demodulator Section	09
RCU-5000 M:N Switch	10
DMD20 Modulator	20
DMD20 Demodulator	21
DMD20 Modem	22
DVB3030 Video Modulator, DM240	23
RCS20 M:N Switch	24
RCS10 M:N Switch	25
RCS11 1:1 Switch	26
Reserved for future equipment types	27-31



Multi-drop override IDs 01 or 02 can be used interchangeably to broadcast a message to a DMD-3000/4000 Modem, DMD-4500/5000, or a DMD20 Modem. Radyne recommends that the multi-drop override IDs be issued only during system configuration as a bus test tool by experienced programmers and that they not be included in run-time software. It is also advantageous to consider the use of multiple bus systems where warranted by a moderate to large equipment complement.

Therefore, if a DMD20 Modulator is queried for its equipment type identifier, it will return a "20" and DMD20 Demodulator will return a "21". A DMD20 Modem will also return a "22".

1.2.6 Software Compatibility:

The COMMSPEC, operating in conjunction within the RLLP shell, provides for full forward and backward software compatibility independent of the software version in use. New features are appended to the end of the DATA field without OPCODE changes. Older software simply discards the data as extraneous information without functional impairment for backward compatibility.

If new device-resident or M&C software receives a message related to an old software version, new information and processes are not damaged or affected by the omission of data.

The implementation of forward and backward software compatibility often, but not always, requires the addition of new Opcodes. Each new function requires a new Opcode assignment if forward and backward compatibility cannot be attained by other means.

When Radyne equipment is queried for bulk information (Query Mod, Query Demod, etc.) it responds by sending back two blocks of data; a Non-Volatile Section (parameters that can be modified by the user) and a Volatile Section (status information). It also returns a count value that indicates the size of the Non-Volatile Section. This count is used by M&C developers to index into the start of the Volatile Section.

When new features are added to Radyne equipment, the control parameters are appended to the end of the Non-Volatile Section, and status of the features, if any, are added at the end of the

Volatile Section. If a remote M&C queries two pieces of Radyne equipment with different revision software, they may respond with two different sized packets. The remote M&C MUST make use of the non-volatile count value to index to the start of the Volatile Section. If the remote M&C is not aware of the newly added features to the Radyne product, it should disregard the parameters at the end of the Non-Volatile Section and index to the start of the Volatile Section.

If packets are handled in this fashion, there will also be backward-compatibility between Radyne equipment and M&C systems. Remote M&C systems need not be modified every time a feature is added unless the user needs access to that feature.

1.2.7 Flow Control and Task Processing:

The original packet sender (the M&C computer) relies on accurate timeout information with regard to each piece of equipment under its control. This provides for efficient bus communication without unnecessary handshake overhead timing. One critical value is designated the Inter-Frame Space (FS). The Inter-Frame Space provides a period of time in which the packet receiver and medium (control bus and M&C computer interface) fully recover from the packet transmission/reception process and the receiver is ready to accept a new message. The programmed value of the Inter-Frame Space should be greater than the sum of the "turnaround time" and the round-trip (sender/receiver/bus) propagation time, including handshake overhead. The term "turnaround time" refers to the amount of time required for a receiver to be re-enabled and ready to receive a packet after having just received a packet. In flow control programming, the Inter-Frame Space may be determined empirically in accord with the system configuration or calculated based on established maximum equipment task processing times.

Each piece of supported equipment on the control bus executes a Radyne Link Level Task (RLLT) in accordance with its internal hardware and fixed program structure. In a flow control example, the RLLT issues an internal "message in" system call to invoke an I/O wait condition that persists until the task receives a command from the M & C computer. The RLLT has the option of setting a timeout on the incoming message. Thus, if the equipment does not receive an information/command packet within a given time period, the associated RLLT exits the I/O wait state and takes appropriate action.

Radyne equipment is logically linked to the control bus via an Internal I/O Processing Task (IOPT) to handle frame sequencing, error checking, and handshaking. The IOPT is essentially a link between the equipment RLLT and the control bus. Each time the M&C computer sends a message packet; the IOPT receives the message and performs error checking. If errors are absent, the IOPT passes the message to the equipment's RLLT. If the IOPT detects errors, it appends error messages to the packet. Whenever an error occurs, the IOPT notes it and discards the message; but it keeps track of the incoming packet. Once the packet is complete, the IOPT conveys the appropriate message to the RLLT and invokes an I/O wait state (wait for next <SYNC> character).

If the RLLT receives the packetized message from the sender before it times out, it checks for any error messages appended by the IOPT. In the absence of errors, the RLLT processes the received command sent via the transmitted packet and issues a "message out" system call to ultimately acknowledge the received packet. This call generates the response packet conveyed to the sender. If the IOPT sensed errors in the received packet and an RLLT timeout has not occurred, the RLLT causes the equipment to issue the appropriate error message(s) in the pending equipment response frame.

To maintain frame synchronization, the IOPT keeps track of error-laden packets and packets intended for other equipment for the duration of each received packet. Once the packet is complete, the IOPT invokes an I/O wait state and searches for the next <SYNC> character.

1.2.8 RLLP Summary:

The RLLP is a simple send-and-wait protocol that automatically re-transmits a packet whenever an error is detected, or when an acknowledgment (response) packet is absent.

During transmission, the protocol wrapper surrounds the actual data to form information packets. Each transmitted packet is subject to time out and frame sequence control parameters, after which the packet sender waits for the receiver to convey its response. Once a receiver verifies that a packet sent to it is in the correct sequence relative to the previously received packet, it computes a local checksum on all information within the packet excluding the <SYNC> character and the <CHECKSUM> fields. If this checksum matches the packet <CHECKSUM>, the receiver processes the packet and responds to the packet sender with a valid response (acknowledgment) packet. If the checksum values do not match, the receiver replies with a negative acknowledgment (NAK) in its response frame.

The response packet is therefore an acknowledgment either that the message was received correctly, or some form of a packetized NAK frame. If the sender receives a valid acknowledgment (response) packet from the receiver, the <FSN> increments and the next packet is transmitted as required by the sender. However, if a NAK response packet is returned the sender re-transmits the original information packet with the same embedded <FSN>.

If an acknowledgment (response) packet or a NAK packet is lost, corrupted, or not issued due to an error and is thereby not returned to the sender, the sender re-transmits the original information packet; but with the same <FSN>. When the intended receiver detects a duplicate packet, the packet is acknowledged with a response packet and internally discarded to preclude undesired repetitive executions. If the M&C computer sends a command packet and the corresponding response packet is lost due to a system or internal error, the computer times out and re-transmits the same command packet with the same <FSN> to the same receiver and waits once again for an acknowledgment or a NAK packet.

To reiterate, the format of the Link Level Protocol Message Block is shown below.

SYNC Byte	Byte COUNT	SOURCE ADDRESS	DESTINATION ADDRESS	FSN	OPCODE	DATA BYTES	CHECKSUM

1.3 Remote Port Packet Structure:

The Modem protocol is an enhancement on the DMD20 protocol. It also uses a packet structure format. The structure is as follows:

<SYNC>: Message format header character that defines the beginning of a message. The <SYNC> character value is always 0x16 (1 byte).

<BYTE COUNT>: The number of bytes in the <DATA> field (2 bytes).

<SOURCE ID>: Identifies the address of the equipment from where the message originated (1 byte).

<DESTINATION ID>: Identifies the address of the equipment where the message is to be sent (1 byte).

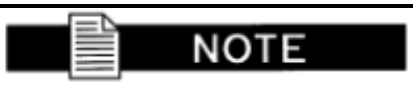
<FSN>: Frame sequence number ensures correct packet acknowledgment and data transfers (1 byte).

<OPCODE>: This byte identifies the message type associated with the information data. The equipment processes the data according to the value in this field. Return error codes and acknowledgment are also included in this field (2 bytes).

<...DATA...>: Information data. The number of data bytes in this field is indicated by the <BYTE COUNT> value.

<CHECKSUM>: The modulo 256 sum of all preceding message bytes excluding the <SYNC> character (1 byte).

The Modem RLLP is not software-compatible with the following previous Radyne products: RCU5000 and DMD4500. These products may not occupy the same bus while using this protocol as equipment malfunction and loss of data may occur.



When transmitting a packet at 9600 baud, the Remote M&C should ensure that the timeout value between characters does not exceed the time it takes to transmit 200 characters (≈ 200 msec). If this timeout value is exceeded, the equipment will timeout.

1.4 DMD20 Opcode Command Set:

The DMD20/DMD20 LBST Opcode Command Set is listed below:

CAUTION!!

When new features are added to Radyne equipment, the control parameters are appended to the end of the Non-Volatile Section of the Remote Communications Specification, and status of the features, if any, are added at the end of the Volatile Section. If a remote M & C queries two pieces of Radyne equipment with different revision software, they could respond with two different sized packets. The remote M & C MUST make use of the non-volatile count value to index to the start of the Volatile Section. If the remote M & C is not aware of the newly added features to the product, it should disregard the parameters at the end of the Non-Volatile Section and index to the start of the Volatile Section.

Before creating any software based on the information contained in this document, contact the Comtech EF Data Customer Service Department (480-333-4357) to find out if the software revision for that piece of equipment is current and that no new features have been added since the release of this document.

1.4.1 Modem Command Set:

Command	Opcode
Query Modulator Configuration and Status	2400h
Query Demodulator Configuration and Status	2401h
Query Modem Drop & Insert Map	2402h
Query Modems Identification	2403h
Query Modem Control Mode	2404h
Query Modulator Latched Alarms	2405h
Query Demodulator Latched Alarms	2406h
Query Modem Latched Alarms	2407h
Query Modulator Current Alarms	2408h
Query Demodulator Current Alarms	2409h
Query Modem Current Alarms	240Ah
Query Modulator Status	240Bh
Query Demodulator Status	240Ch
Query Modem Eb/No, BER and Level	240Dh
Query Time	240Eh
Query Date	240Fh
Query Time and Date	2410h
Query Modem Summary Faults	2411h
Query Modem Event Buffer	2412h
Query Modulator Configuration	2448h
Query Demodulator Configuration	2449h
Query Modem Features	2450h
Query Modulator Async Configuration	2451h
Query Demodulator Async Configuration	2452h
Query Up converter Configuration	2490h
Query Uplink RF	2491h
Query Down converter Configuration	2492h
Query Downlink RF	2493h
Query Demodulator Ethernet Terrestrial Interface Packet Status	2494h

Query CNC Status	2495h
Query BUC FSK Pass Thru Reply	2E06h

Command	Opcode
Command Up converter Configuration	2500h
Command Uplink RF	2501h
Command Down converter Configuration	2502h
Command Downlink RF	2503h
Command Modem Control Mode	2600h
Command Modulator Configuration	2601h
Command Modulator Frequency	2602h
Command Modulator Strap Code	2603h
Command Modulator Data Rate	2604h
Command Modulator Filter Mask	2605h
Command Modulator Modulation Type	2606h
Command Modulator Convolutional Encoder	2607h
Command Modulator Differential Encoder	2608h
Command Modulator Carrier Control	2609h
Command Modulator Carrier Selection	260Ah
Command Modulator Clock Control	260Bh
Command Modulator Clock Polarity	260Ch
Command Modulator SCT Source	260Dh
Command Modulator Drop Mode	260Eh
Command Modulator Output Level	260Fh
Command Modulator Reed Solomon	2610h
Command Modulator Spectrum	2611h
Command Modulator Test Pattern	2612h
Command Modulator Scrambler Control	2613h
Command Modulator Scrambler Type	2614h
Command Modulator Framing	2615h
Command Modulator External Reference Source	2616h
Command Modulator Terrestrial Loopback	2617h
Command Modulator Baseband Loopback	2618h
Command Modulator Network Spec	2619h
Command Modulator External EXC Clock	261Ah
Command Modulator External Reference Frequency	261Bh
Command Modulator T1 D4 Yellow Alarm Selection	261Dh
Command Modulator Interface Type	261Eh
Command Modulator Circuit ID	261Fh
Command Force Modulator Alarm Test	2622h
Command Modulator Data Invert	2623h
Clear Modulator Latched Alarm 1	2625h
Command AUPC Local Enable	2629h
Command AUPC Remote Enable	262Ah
Command AUPC Local CL Action	262Bh
Command AUPC Remote CL Action	262Ch
Command AUPC Tracking Rate	262Dh
Command AUPC Remote BB Loopback	262Eh
Command AUPC Remote Test 2047	262Fh
Command AUPC Eb/No	2630h
Command AUPC Minimum Power	2631h
Command AUPC Maximum Power	2632h
Command AUPC Nominal Power	2633h

Command AUPC Local Configuration	2634h
Command AUPC Remote Configuration	2635h
Command Modulator Reed Solomon N & K Codes and Interleaver Depth	2636h
Command Modulator TPC Interleaver	2638h
Command Modulator Async Configuration	2640h
Command Minor Alarm Relay Usage	2641h
Command Modulator Ethernet Terrestrial Interface Configuration	2642h
Command Demodulator Configuration	2A00h
Command Demodulator Frequency	2A01h
Command Demodulator Data Rate	2A02h
Command Demodulator Strap Code	2A03h
Command Demodulator Sweep Boundary	2A04h
Command Demodulator Sweep Delay	2A05h
Command Demodulator Demodulation Type	2A07h
Command Demodulator Convolutional Decoder	2A08h
Command Demodulator Differential Decoder	2A09h
Command Demodulator Reed Solomon	2A0Ah
Command Demodulator Network Spec	2A0Bh
Command Demodulator Filter Mask	2A0Ch
Command Demodulator Descrambler Control	2A0Dh
Command Demodulator Descrambler Type	2A0Eh
Command Demodulator Spectrum	2A0Fh
Command Demodulator Buffer Size	2A10h
Command Demodulator Buffer Clock	2A11h
Command Demodulator Buffer Clock Polarity	2A12h
Command Demodulator Insert Mode	2A13h
Command Demodulator T1 E1 Frame Source	2A15h
Command Demodulator Framing	2A16h
Command Demodulator Test Pattern	2A17h
Command Map Summary to Backward Alarm	2A18h
Command Demodulator BER Exponent	2A1Ah
Command Demodulator Circuit ID	2A1Bh
Command Demodulator Terrestrial Loopback	2A1Ch
Command Demodulator Baseband Loopback	2A1Dh
Command Demodulator IF Loopback	2A1Eh
Command Demodulator Interface Type	2A1Fh
Command Center Buffer	2A20h
Command Demodulator Data Invert	2A21h
Command Force Demodulator Alarm Test	2A22h
Command External EXC Source	2A23h
Clear Demodulator Latched Alarm 1	2A24h
Clear Demodulator Latched Alarm 2	2A25h
Clear Demodulator Latched Alarm 3	2A26h
Command Demodulator Reacquisition Boundary	2A2Fh
Command Demodulator Reed Solomon N & K Codes and Interleaver Depth	2A32h
Command Demodulator TPC Interleaver	2A34h
Command Demodulator Async Configuration	2A35h
Command Demodulator Fast Acquisition	2A36h
Command Clear Demodulator Ethernet Terrestrial Interface Packet Status	2A37h
Command Demodulator RFM AGC Time Constant	2A38h
Command CNC Setup	2A39h
Command Drop and Insert Map Copy	2C00h
Command Drop and Insert Map	2C01h

Command Clear Latched Alarms	2C03h
Command Set Time	2C04h
Command Set Date	2C05h
Command Set Time and Date	2C06h
Clear Modem Common Latched Alarm 1	2C08h
Clear Modem Common Latched Alarm 2	2C09h
Command Delete Modem Event Buffer	2C0Ah
Command Soft Reset	2C0Bh
Command BUC FSK Pass Thru	2F61h

1.5 Detailed Command Descriptions:

1.5.1 DMD20 Modulator:

Opcode: <2400h> Query a Modulator's Configuration and Status

Query Response (205 Bytes)		
<1>	Number of nonvol bytes	Number of Configuration Bytes
Configuration Bytes (162 Nonvol Bytes)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem
<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz
<2>	Strap Code	Binary value
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35
<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50
<4>	External Clock Frequency	Binary value, 1 Hz steps 2.4 kHz to 20 MHz For DMD20 2.4 kHz to 52 MHz For DMD2050, DMD2050E and DMD50
<4>	External Reference Frequency	Binary value, 8 kHz steps, 256 kHz to 10 MHz
<1>	Frequency Reference Source	0 = Internal, 1 = External, 2 = High stability
<1>	Modulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM

<1>	Convolutional Encoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5
<1>	Reed Solomon	0 = Disabled, 1 = Enabled
<1>	Scrambler Control	0 = Disabled, 1 = Enabled
<1>	Scrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync
<2>	Transmit Power Level	For DMD20 Signed value, 0 to -250 (0.0 to -25.0 dBm) (two's compliment) For OM20 Signed value, -200 to -450 (-20.0 to -45.0 dBm) For DMD2050E Signed value. 0 to -450 (0.0 to -45.0 dBM)
<1>	Differential Encoder	0 = Disabled, 1 = Enabled
<1>	Carrier Control	0 = Off, 1 = On, 2 = Auto, 3 = VSAT, 4 = RTS (Refer To Appendix E)
<1>	Carrier Selection	0 = Normal, 1 = CW, 2 = Dual, 3 = Offset, 4 = Pos Fir, 5 = Neg Fir
<1>	Spectrum	0 = Normal, 1 = Inverted
<1>	TX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1
<1>	Clock Control	0 = SCTE, 1 = SCT
<1>	Clock Polarity	0 = Normal, 1 = Inverted, 2 = Auto
<1>	SCT Source	0 = Internal, 1 = SCR
<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem
<1>	Drop Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S
<30>	Drop Map	Timeslots to drop organized by satellite channel (Mapping of Satellite Channels 1 thru 30 to dropped Terrestrial Timeslots (Terrestrial Timeslots = 1..31))
<1>	T1D4 Yellow Alarm Select	Reserved

<1>	Forced Backward Alarms	Bit 0 = Backward Alarm 1 IDR and IBS Bit 1 = Backward Alarm 2 IDR Bit 2 = Backward Alarm 3 IDR Bit 3 = Backward Alarm 4 IDR Bits 4 & 5 = Reserved Bit 6 = IBS Prompt Bit 7 = IBS Service 0 = None, 1 = Force
<1>	Alarm 1 Mask	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock Bits 5 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Alarm 2 Mask	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Mask, 1 = Allow
<1>	Common Alarm 1 Mask	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	Common Alarm 2 Mask	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Mask, 1 = Allow
<11>	Tx Circuit ID	11 ASCII characters, null terminated
<1>	Tx ESC Ch 1 Volume	-20 to +10 (+10 dBm to –20 dBm) (two's compliment)
<1>	Tx ESC Ch 2 Volume	-20 to +10 (+10 dBm to –20 dBm) (two's compliment)
<1>	Tx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3

<1>	Tx Terrestrial Loopback	0 = Disabled, 1 = Enabled
<1>	Tx Baseband Loopback	0 = Disabled, 1 = Enabled
<1>	Drop Status Mask	Bit 0 = Frame lock fault Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled Bits 3 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Tx RS N Code	2 – 255, Reed-Solomon code word length
<1>	Tx RS K Code	1 – 254, Reed-Solomon message length
<1>	Tx RS Depth	4, 8, or 12
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband
<1>	BPSK Symbol Pairing	0 = Normal Pairing, 1 = Swapped Pairing
<1>	IDR Overhead Type	0 = 32K Voice, 1 = 64K Data
<1>	Terminal Emulation	0 = Adds Viewpoint, 1 = VT100, 2 = WYSE50
<1>	Terminal Baud Rate	0 = 300, 1 = 600, 2 = 1200, 3 = 2400, 4 = 4800, 5 = 9600, 6 = 19200, 7 = 38400, 8 = 57600, 9 = 1152000, 10 = 150
<1>	FM Orderwire Mode	Reserved
<1>	FM Orderwire Test Tone	Reserved
<1>	AUPC Local Enable	0 = Off, 1 = EF AUPC, 2 = Radyne AUPC
<1>	AUPC Remote Enable	0 = Off, 1 = EF AUPC
<1>	AUPC Local CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Remote CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Tracking Rate	0 = 0.5 dB/Min, 1 = 1.0 dB/Min, 2 = 1.5 dB/Min, 3 = 2.0 dB/Min, 4 = 2.5 dB/Min, 5 = 3.0 dB/Min, 6 = 3.5 dB/Min, 7 = 4.0 dB/Min, 8 = 4.5 dB/Min, 9 = 5.0 dB/Min, 10 = 5.5 dB/Min, 11 = 6.0 dB/min
<1>	AUPC Remote BB Loopback	0 = Disabled, 1 = Enabled
<1>	AUPC Remote 2047	0 = Disabled, 1 = Enabled
<2>	AUPC Target Eb/No	Target Eb/No at Receiver, 400 to 2000 (4.00 db to 20.00 db)
<2>	AUPC Minimum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Maximum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Nominal Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<1>	TMT Pattern Enable	Reserved
<1>	TMT Pattern Length	Reserved

<1>	Terrestrial Framing	0 = DVB 188, 1 = DVB 204, 2 = NONE
<1>	Alarm 4 Mask	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Mask, 1 = Allow
<1>	TPC Interleaver	0 = Disabled, 1 = Enabled
<1>	Ethernet Flow Control	0 = Disabled, 1 = Enabled
<1>	Ethernet Daisy Chain	0 = Disabled, 1 = Enabled (Port 4)
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS232, 1 = RS485
<1>	ES Baud Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 bits, 1 = 8 bits
<1>	Carrier Enable Delay	0 – 255 in seconds
<1>	SCC Control Ratio	1 = 1/1, 2 = 1/2, 3 = 1/3, 4 = 1/4, 5 = 1/5, 6 = 1/6, 7 = 1/7
<4>	SCC In band Rate	300 to 200000 bps
<2>	LBST BUC DC Voltage Alarm Lower Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST BUC DC Voltage Alarm Upper Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST BUC DC Current Alarm Lower Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	LBST BUC DC Current Alarm Upper Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	Compensation	TX Power Level offset from 0 to 10 (0.0 dBm to 1.0 dBm), Implied decimal point
<1>	Forced Alarm Test	Bit 0 = Tx Major Alarm Bits 1 – 7 = Spares 0 = Not Forced, 1 = Forced
<1>	Asynchronous In-Band Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	FSK Communications Select	0 = None, 1 = Codan, 2 = TerraSat, 3 = Amplus
<1>	FSK Test Type	0 = None, 1 = Loopback, 2 = Cycle TX Enable, 3 = Codan Pass thru, 4 = TerraSat pass thru, 5 = Amplus Pass thru, 6 = Query for address
<2>	BUC Address	
<1>	BUC Output Enable	0 = Disabled, 1 = Enabled
<1>	Minor Alarm Relay Usage	0 = undefined, 1= IBS Usage, 2 = IBS & Minor Alarms, 3 = IBS, Minor Alarms and Major Alarms
<1>	Ethernet QOS Type	0 = Normal, 1 = Port based
<1>	Ethernet QOS QUEUE	0 = Fair Weighted, 1 = Strict Priority

<1>	EBEM overhead channel rate	0 = Off, 1 = 8K, 2 = 16K, 3 = 24K, 4 = 32K, 5 = 40K, 6 = 48K, 7 = 56K, 8 = 64K
<1>	EBEM embedded channel	0 = Off, 1 = On
<1>	EBEM ITA	0 = Disabled, 1 = Enabled
<1>	EBEM encryption	0 = Disabled, 1 = Enabled
<4>	EBEM Ethernet rate	4800 to 52000000
<1>	Ethernet HDLC	0= Radyne, 1 = Comtech, 2 = Managed 570
Status Bytes (42 Bytes)		
<1>	Control Mode	0 = Front Panel, 1 = Terminal, 2 = Computer, Note: DMD20 will always return 2 = Computer
<1>	Revision Number	Decimal point implied
<1>	Alarm 1	Bit 0 = Transmit FPGA/Processor Fault, 1 = Fail Bit 1 = Drop DSP, 1 = Fail Bit 2 = Transmit Symbol Clock PLL Lock, 1 = Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock, 1 = Lock Bits 5 & 6 = Reserved Bit 7 = Mod Summary Fault, 1 = Fail
<1>	Alarm 2	Bit 0 = Terrestrial Clock Activity Detect, 1 = Activity Bit 1 = Internal Clock Activity Detect, 1 = Activity Bit 2 = Tx Sat Clock Activity Detect, 1 = Activity Bit 3 = Tx Data Activity Detect, 1 = Activity Bit 4 = Terrestrial AIS. Tx Data AIS Detect, 1 = AIS Fail Bit 5 = Tx Clock Fallback, 1 = Clock Fallback Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = TPC Conflict Check, 1 = Fail
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare
<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail
<1>	Latched Alarm 1	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = Transmit L-Band Synthesizer Lock Bits 5 – 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 - 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched

<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched
<1>	Drop Status	Bit 0 = Frame lock fault. 1 = Fail Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C, 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled, 1 = Fail Bits 3 - 7 = Reserved
<1>	Online Flag	Online Switch Status: 0 = Offline, 1 = Online (DMD20 is always online)
<1>	+5V Voltage	+5V, Implied decimal point; 49 = +4.9 V
<1>	+12V Voltage	+12V, Implied decimal point; 121 = +12.1 V
<1>	-12V Voltage	-12V, Implied decimal point; 118 = -11.8 V (two's compliment)
<2>	Reserved	Ignore
<1>	ESC Source	0 = Internal, 1 = External
<1>	Backward Alarms	Bit 0 = Backward Alarm 1 Transmitted Bit 1 = Backward Alarm 2 Transmitted Bit 2 = Backward Alarm 3 Transmitted Bit 3 = Backward Alarm 4 Transmitted Bits 4 & 5 = Spares Bit 6 = IBS Prompt Alarm Transmitted Bit 7 = IBS Service Alarm Transmitted 0 = No, 1 = Yes
<2>	AUPC Remote Test 2047 Mantissa	Binary value with implied decimal point; 795 = 7.95
<1>	AUPC Remote Test 2047 BER Exponent	Binary value with implied sign; 6 = -6
<1>	Reserved	Ignore
<4>	Symbol Rate	Binary value, 1 sps steps
<1>	Latched Alarm 2	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Not Latched, 1 = Latched
<1>	Alarm 4	Bit 0 = LBST BUC DC Current Alarm, 1 = Fail Bit 1 = LBST BUC DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bit 3 = LBST BUC PLL Alarm, 1 = Fail Bit 4 = LBST BUC Over Temperature Alarm, 1 = Fail Bit 5 = LBST BUC Summary Alarm, 1 = Fail Bit 6 = LBST BUC Output Enable Alarm, 1 = Fail Bit 7 = LBST BUC Communications Alarm, 1 = Fail

<1>	Latched Alarm 4	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Not Latched, 1 = Latched
<1>	Reserved	Ignore
<2>	LBST BUC DC Current	Amps, Implied decimal point, 1000 = 1.000A
<2>	LBST BUC DC Voltage	Volts, Implied decimal point, 10 = 1.0V
<1>	FSK Test Result	0 = Pass, 1 = Fail
<2>	BUC Carrier Level	Implied decimal point, dBm
<4>	BUC Summary Status	
<1>	BUC Temperature	Implied Decimal Point, C

Opcode: <2448h> Query a Modulator's Configuration

Query Response (162 Bytes)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem
<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz
<2>	Strap Code	Binary value
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35
<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50
<4>	External Clock Frequency	Binary value, 1 Hz steps 2.4 kHz to 20 MHz For DMD20 2.4 kHz to 52 MHz For DMD2050, DMD2050E and DMD50
<4>	External Reference Frequency	Binary value, 8 kHz steps, 256 kHz to 10 MHz
<1>	Frequency Reference Source	0 = Internal, 1 = External, 2 = High stability
<1>	Modulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM

<1>	Convolutional Encoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5
<1>	Reed Solomon	0 = Disabled, 1 = Enabled
<1>	Scrambler Control	0 = Disabled, 1 = Enabled
<1>	Scrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync
<2>	Transmit Power Level	For DMD20 Signed value, 0 to -250 (0.0 to -25.0 dBm) (two's compliment) For OM20 Signed value, -200 to -450 (-20.0 to -45.0 dBm) For DMD2050E Signed value. 0 to -450 (0.0 to -45.0 dBM)
<1>	Differential Encoder	0 = Disabled, 1 = Enabled
<1>	Carrier Control	0 = Off, 1 = On, 2 = Auto, 3 = VSAT, 4 = RTS (Refer To Appendix E)
<1>	Carrier Selection	0 = Normal, 1 = CW, 2 = Dual, 3 = Offset, 4 = Pos Fir, 5 = Neg Fir
<1>	Spectrum	0 = Normal, 1 = Inverted
<1>	TX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1
<1>	Clock Control	0 = SCTE, 1 = SCT
<1>	Clock Polarity	0 = Normal, 1 = Inverted, 2 = Auto
<1>	SCT Source	0 = Internal, 1 = SCR
<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem
<1>	Drop Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S
<30>	Drop Map	Timeslots to drop organized by satellite channel (Mapping of Satellite Channels 1 thru 30 to dropped Terrestrial Timeslots (Terrestrial Timeslots = 1..31))
<1>	T1D4 Yellow Alarm Select	Reserved

<1>	Forced Backward Alarms	Bit 0 = Backward Alarm 1 IDR and IBS Bit 1 = Backward Alarm 2 IDR Bit 2 = Backward Alarm 3 IDR Bit 3 = Backward Alarm 4 IDR Bits 4 & 5 = Reserved Bit 6 = IBS Prompt Bit 7 = IBS Service 0 = None, 1 = Force
<1>	Alarm 1 Mask	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock Bits 5 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Alarm 2 Mask	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Mask, 1 = Allow
<1>	Common Alarm 1 Mask	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	Common Alarm 2 Mask	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Mask, 1 = Allow
<11>	Tx Circuit ID	11 ASCII characters, null terminated
<1>	Tx ESC Ch 1 Volume	-20 to +10 (+10 dBm to –20 dBm) (two's compliment)
<1>	Tx ESC Ch 2 Volume	-20 to +10 (+10 dBm to –20 dBm) (two's compliment)
<1>	Tx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3

<1>	Tx Terrestrial Loopback	0 = Disabled, 1 = Enabled
<1>	Tx Baseband Loopback	0 = Disabled, 1 = Enabled
<1>	Drop Status Mask	Bit 0 = Frame lock fault Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled Bits 3 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Tx RS N Code	2 – 255, Reed-Solomon code word length
<1>	Tx RS K Code	1 – 254, Reed-Solomon message length
<1>	Tx RS Depth	4, 8, or 12
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband
<1>	BPSK Symbol Pairing	0 = Normal Pairing, 1 = Swapped Pairing
<1>	IDR Overhead Type	0 = 32K Voice, 1 = 64K Data
<1>	Terminal Emulation	0 = Adds Viewpoint, 1 = VT100, 2 = WYSE50
<1>	Terminal Baud Rate	0 = 300, 1 = 600, 2 = 1200, 3 = 2400, 4 = 4800, 5 = 9600, 6 = 19200, 7 = 38400, 8 = 57600, 9 = 1152000, 10 = 150
<1>	FM Orderwire Mode	Reserved
<1>	FM Orderwire Test Tone	Reserved
<1>	AUPC Local Enable	0 = Off, 1 = EF AUPC, 2 = Radyne AUPC
<1>	AUPC Remote Enable	0 = Off, 1 = EF AUPC
<1>	AUPC Local CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Remote CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Tracking Rate	0 = 0.5 dB/Min, 1 = 1.0 dB/Min, 2 = 1.5 dB/Min, 3 = 2.0 dB/Min, 4 = 2.5 dB/Min, 5 = 3.0 dB/Min, 6 = 3.5 dB/Min, 7 = 4.0 dB/Min, 8 = 4.5 dB/Min, 9 = 5.0 dB/Min, 10 = 5.5 dB/Min, 11 = 6.0 dB/min
<1>	AUPC Remote BB Loopback	0 = Disabled, 1 = Enabled
<1>	AUPC Remote 2047	0 = Disabled, 1 = Enabled
<2>	AUPC Target Eb/No	Target Eb/No at Receiver, 400 to 2000 (4.00 db to 20.00 db)
<2>	AUPC Minimum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Maximum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Nominal Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<1>	TMT Pattern Enable	Reserved
<1>	TMT Pattern Length	Reserved

<1>	Terrestrial Framing	0 = DVB 188, 1 = DVB 204, 2 = NONE
<1>	Alarm 4 Mask	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Mask, 1 = Allow
<1>	TPC Interleaver	0 = Disabled, 1 = Enabled
<1>	Ethernet Flow Control	0 = Disabled, 1 = Enabled
<1>	Ethernet Daisy Chain	0 = Disabled, 1 = Enabled (Port 4)
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS232, 1 = RS485
<1>	ES Baud Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 bits, 1 = 8 bits
<1>	Carrier Enable Delay	0 – 255 in seconds
<1>	SCC Control Ratio	1 = 1/1, 2 = 1/2, 3 = 1/3, 4 = 1/4, 5 = 1/5, 6 = 1/6, 7 = 1/7
<4>	SCC In band Rate	300 to 200000 bps
<2>	LBST BUC DC Voltage Alarm Lower Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST BUC DC Voltage Alarm Upper Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST BUC DC Current Alarm Lower Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	LBST BUC DC Current Alarm Upper Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	Compensation	TX Power Level offset from 0 to 10 (0.0 dBm to 1.0 dBm), Implied decimal point
<1>	Forced Alarm Test	Bit 0 = Tx Major Alarm Bits 1 – 7 = Spares 0 = Not Forced, 1 = Forced
<1>	Asynchronous In-Band Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	FSK Communications Select	0 = None, 1 = Codan, 2 = TerraSat, 3 = Amplus
<1>	FSK Test Type	0 = None, 1 = Loopback, 2 = Cycle TX Enable, 3 = Codan Pass thru, 4 = TerraSat pass thru, 5 = Amplus Pass thru, 6 = Query for address
<2>	BUC Address	
<1>	BUC Output Enable	0 = Disabled, 1 = Enabled
<1>	Minor Alarm Relay Usage	0 = undefined, 1= IBS Usage, 2 = IBS & Minor Alarms, 3 = IBS, Minor Alarms and Major Alarms
<1>	Ethernet QOS Type	0 = Normal, 1 = Port based
<1>	Ethernet QOS QUEUE	0 = Fair Weighted, 1 = Strict Priority

<1>	EBEM overhead channel rate	0 = Off, 1 = 8K, 2 = 16K, 3 = 24K, 4 = 32K, 5 = 40K, 6 = 48K, 7 = 56K, 8 = 64K
<1>	EBEM embedded channel	0 = Off, 1 = On
<1>	EBEM ITA	0 = Disabled, 1 = Enabled
<1>	EBEM encryption	0 = Disabled, 1 = Enabled
<4>	EBEM Ethernet rate	4800 to 52000000
<1>	Ethernet HDLC	0= Radyne, 1 = Comtech, 2 = Managed 570

Opcode: <240Bh> Query a Modulator's Status

Query Response (42 Bytes)		
<1>	Control Mode	0 = Front Panel, 1 = Terminal, 2 = Computer, Note: DMD20 will always return 2 = Computer
<1>	Revision Number	Decimal point implied
<1>	Alarm 1	Bit 0 = Transmit FPGA/Processor Fault, 1 = Fail Bit 1 = Drop DSP, 1 = Fail Bit 2 = Transmit Symbol Clock PLL Lock, 1 = Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock, 1 = Lock Bits 5 & 6 = Reserved Bit 7 = Mod Summary Fault, 1 = Fail
<1>	Alarm 2	Bit 0 = Terrestrial Clock Activity Detect, 1 = Activity Bit 1 = Internal Clock Activity Detect, 1 = Activity Bit 2 = Tx Sat Clock Activity Detect, 1 = Activity Bit 3 = Tx Data Activity Detect, 1 = Activity Bit 4 = Terrestrial AIS. Tx Data AIS Detect, 1 = AIS Fail Bit 5 = Tx Clock Fallback, 1 = Clock Fallback Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = TPC Conflict Check, 1 = Fail
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare
<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail
<1>	Latched Alarm 1	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = Transmit L-Band Synthesizer Lock Bits 5 -7 = Reserved 0 = Not Latched, 1 = Latched

<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 - 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched
<1>	Drop Status	Bit 0 = Frame lock fault. 1 = Fail Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C, 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled, 1 = Fail Bits 3 - 7 = Reserved
<1>	Online Flag	Online Switch Status: 0 = Offline, 1 = Online (DMD20 is always online)
<1>	+5V Voltage	+5V, Implied decimal point; 49 = +4.9 V
<1>	+12V Voltage	+12V, Implied decimal point; 121 = +12.1 V
<1>	-12V Voltage	-12V, Implied decimal point; 118 = -11.8 V (two's compliment)
<2>	Reserved	Ignore
<1>	ESC Source	0 = Internal, 1 = External
<1>	Backward Alarms	Bit 0 = Backward Alarm 1 Transmitted Bit 1 = Backward Alarm 2 Transmitted Bit 2 = Backward Alarm 3 Transmitted Bit 3 = Backward Alarm 4 Transmitted Bits 4 & 5 = Spares Bit 6 = IBS Prompt Alarm Transmitted Bit 7 = IBS Service Alarm Transmitted 0 = No, 1 = Yes
<2>	AUPC Remote Test 2047 Mantissa	Binary value with implied decimal point; 795 = 7.95
<1>	AUPC Remote Test 2047 BER Exponent	Binary value with implied sign; 6 = -6
<1>	Reserved	Ignore
<4>	Symbol Rate	Binary value, 1 sps steps
<1>	Latched Alarm 2	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Not Latched, 1 = Latched

<1>	Alarm 4	Bit 0 = LBST BUC DC Current Alarm, 1 = Fail Bit 1 = LBST BUC DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bit 3 = LBST BUC PLL Alarm, 1 = Fail Bit 4 = LBST BUC Over Temperature Alarm, 1 = Fail Bit 5 = LBST BUC Summary Alarm, 1 = Fail Bit 6 = LBST BUC Output Enable Alarm, 1 = Fail Bit 7 = LBST BUC Communications Alarm, 1 = Fail
<1>	Latched Alarm 4	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Not Latched, 1 = Latched
<1>	Reserved	Ignore
<2>	LBST BUC DC Current	Amps, Implied decimal point, 1000 = 1.000A
<2>	LBST BUC DC Voltage	Volts, Implied decimal point, 10 = 1.0V
<1>	FSK Test Result	0 = Pass, 1 = Fail
<2>	BUC Carrier Level	Implied decimal point, dBm
<4>	BUC Summary Status	
<1>	BUC Temperature	Implied Decimal Point, C

Opcode: <2405h> Query a Modulator's Latched Alarms

Query Response (5 Bytes)		
<1>	Latched Alarm 1	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = Transmit L-Band Synthesizer Lock Bits 5 – 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched

<1>	Latched Alarm 2	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 4	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Not Latched, 1 = Latched

Opcode: <2408h> Query a Modulator's Current Alarms

Query Response (7 Bytes)		
<1>	Alarm 1	Bit 0 = Transmit FPGA/Processor Fault, 1 = Fail Bit 1 = Drop DSP, 1 = Fail Bit 2 = Transmit Symbol Clock PLL Lock, 1 = Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock, 1 = Lock Bits 5 & 6 = Reserved Bit 7 = Mod Summary Fault, 1 = Fail
<1>	Alarm 2	Bit 0 = Terrestrial Clock Activity Detect, 1 = Activity Bit 1 = Internal Clock Activity Detect, 1 = Activity Bit 2 = Tx Sat Clock Activity Detect, 1 = Activity Bit 3 = Tx Data Activity Detect, 1 = Activity Bit 4 = Terrestrial AIS. Tx Data AIS Detect, 1 = AIS Fail Bit 5 = Tx Clock Fallback, 1 = Clock Fallback Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = TPC Conflict Check, 1 = Fail
<1>	Drop Status Fault	Bit 0 = Frame lock fault, 1 = Fail Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C, 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled, 1 = Fail Bits 3 – 7 = Reserved
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare

<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail
<1>	Backward Alarms	Bit 0 = Backward Alarm 1 Transmitted Bit 1 = Backward Alarm 2 Transmitted Bit 2 = Backward Alarm 3 Transmitted Bit 3 = Backward Alarm 4 Transmitted Bits 4 & 5 = Spares Bit 6 = IBS Prompt Alarm Transmitted Bit 7 = IBS Service Alarm Transmitted 0 = No, 1 = Yes
<1>	Alarm 4	Bit 0 = LBST BUC DC Current Alarm, 1 = Fail Bit 1 = LBST BUC DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bit 3 = LBST BUC PLL Alarm, 1 = Fail Bit 4 = LBST BUC Over Temperature Alarm, 1 = Fail Bit 5 = LBST BUC Summary Alarm, 1 = Fail Bit 6 = LBST BUC Output Enable Alarm, 1 = Fail Bit 7 = LBST BUC Communications Alarm, 1 = Fail

Opcode: <2451h> Query a Modulator's Async Configuration

Query Response (4 Bytes)		
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS232, 1 = RS485
<1>	ES Baud Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 bits, 1 = 8 bits

Opcode: <2600h> Command a Modem's Control Mode (Deprecated on DMD20, listed for backward compatibility only)

Command Data (1 Byte)		
<1>	Modem control mode	0 = Front panel, 1 = Terminal, 2 = Computer

Opcode: <2601h> Command a Modulator's Configuration

Command Data (162 Bytes)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem
<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz
<2>	Strap Code	Binary value
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35

<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50
<4>	External Clock Frequency	Binary value, 1 Hz steps 2.4 kHz to 20 MHz For DMD20 2.4 kHz to 52 MHz For DMD2050, DMD2050E and DMD50
<4>	External Reference Frequency	Binary value, 8 kHz steps, 256 kHz to 10 MHz
<1>	Frequency Reference Source	0 = Internal, 1 = External, 2 = High stability
<1>	Modulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM
<1>	Convolutional Encoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5
<1>	Reed Solomon	0 = Disabled, 1 = Enabled
<1>	Scrambler Control	0 = Disabled, 1 = Enabled
<1>	Scrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync
<2>	Transmit Power Level	For DMD20 Signed value, 0 to -250 (0.0 to -25.0 dBm) (two's compliment) For OM20 Signed value, -200 to -450 (-20.0 to -45.0 dBm) For DMD2050E Signed value. 0 to -450 (0.0 to -45.0 dBM)
<1>	Differential Encoder	0 = Disabled, 1 = Enabled
<1>	Carrier Control	0 = Off, 1 = On, 2 = Auto, 3 = VSAT, 4 = RTS (Refer To Appendix E)
<1>	Carrier Selection	0 = Normal, 1 = CW, 2 = Dual, 3 = Offset, 4 = Pos Fir, 5 = Neg Fir
<1>	Spectrum	0 = Normal, 1 = Inverted
<1>	TX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1
<1>	Clock Control	0 = SCTE, 1 = SCT
<1>	Clock Polarity	0 = Normal, 1 = Inverted, 2 = Auto
<1>	SCT Source	0 = Internal, 1 = SCR

<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem
<1>	Drop Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S
<30>	Drop Map	Timeslots to drop organized by satellite channel (Mapping of Satellite Channels 1 thru 30 to dropped Terrestrial Timeslots (Terrestrial Timeslots = 1..31))
<1>	T1D4 Yellow Alarm Select	Reserved
<1>	Forced Backward Alarms	Bit 0 = Backward Alarm 1 IDR and IBS Bit 1 = Backward Alarm 2 IDR Bit 2 = Backward Alarm 3 IDR Bit 3 = Backward Alarm 4 IDR Bits 4 & 5 = Reserved Bit 6 = IBS Prompt Bit 7 = IBS Service 0 = None, 1 = Force
<1>	Alarm 1 Mask	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock Bits 5 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Alarm 2 Mask	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Mask, 1 = Allow
<1>	Common Alarm 1 Mask	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	Common Alarm 2 Mask	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Mask, 1 = Allow
<11>	Tx Circuit ID	11 ASCII characters, null terminated
<1>	Tx ESC Ch 1 Volume	-20 to +10 (+10 dBm to –20 dBm) (two's compliment)
<1>	Tx ESC Ch 2 Volume	-20 to +10 (+10 dBm to –20 dBm) (two's compliment)

<1>	Tx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3
<1>	Tx Terrestrial Loopback	0 = Disabled, 1 = Enabled
<1>	Tx Baseband Loopback	0 = Disabled, 1 = Enabled
<1>	Drop Status Mask	Bit 0 = Frame lock fault Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled Bits 3 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Tx RS N Code	2 – 255, Reed-Solomon code word length
<1>	Tx RS K Code	1 – 254, Reed-Solomon message length
<1>	Tx RS Depth	4, 8, or 12
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband
<1>	BPSK Symbol Pairing	0 = Normal Pairing, 1 = Swapped Pairing
<1>	IDR Overhead Type	0 = 32K Voice, 1 = 64K Data
<1>	Terminal Emulation	0 = Adds Viewpoint, 1 = VT100, 2 = WYSE50
<1>	Terminal Baud Rate	0 = 300, 1 = 600, 2 = 1200, 3 = 2400, 4 = 4800, 5 = 9600, 6 = 19200, 7 = 38400, 8 = 57600, 9 = 1152000, 10 = 150
<1>	FM Orderwire Mode	Reserved
<1>	FM Orderwire Test Tone	Reserved
<1>	AUPC Local Enable	0 = Off, 1 = EF AUPC, 2 = Radyne AUPC
<1>	AUPC Remote Enable	0 = Off, 1 = EF AUPC
<1>	AUPC Local CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Remote CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Tracking Rate	0 = 0.5 dB/Min, 1 = 1.0 dB/Min, 2 = 1.5 dB/Min, 3 = 2.0 dB/Min, 4 = 2.5 dB/Min, 5 = 3.0 dB/Min, 6 = 3.5 dB/Min, 7 = 4.0 dB/Min, 8 = 4.5 dB/Min, 9 = 5.0 dB/Min, 10 = 5.5 dB/Min, 11 = 6.0 dB/min
<1>	AUPC Remote BB Loopback	0 = Disabled, 1 = Enabled
<1>	AUPC Remote 2047	0 = Disabled, 1 = Enabled
<2>	AUPC Target Eb/No	Target Eb/No at Receiver, 400 to 2000 (4.00 db to 20.00 db)

<2>	AUPC Minimum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Maximum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Nominal Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<1>	TMT Pattern Enable	Reserved
<1>	TMT Pattern Length	Reserved
<1>	Terrestrial Framing	0 = DVB 188, 1 = DVB 204, 2 = NONE
<1>	Alarm 4 Mask	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Mask, 1 = Allow
<1>	TPC Interleaver	0 = Disabled, 1 = Enabled
<1>	Ethernet Flow Control	0 = Disabled, 1 = Enabled
<1>	Ethernet Daisy Chain	0 = Disabled, 1 = Enabled (Port 4)
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS232, 1 = RS485
<1>	ES Baud Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 bits, 1 = 8 bits
<1>	Carrier Enable Delay	0 – 255 in seconds
<1>	SCC Control Ratio	1 = 1/1, 2 = 1/2, 3 = 1/3, 4 = 1/4, 5 = 1/5, 6 = 1/6, 7 = 1/7
<4>	SCC In band Rate	300 to 200000 bps
<2>	LBST BUC DC Voltage Alarm Lower Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST BUC DC Voltage Alarm Upper Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST BUC DC Current Alarm Lower Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	LBST BUC DC Current Alarm Upper Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	Compensation	TX Power Level offset from 0 to 10 (0.0 dBm to 1.0 dBm), Implied decimal point
<1>	Forced Alarm Test	Bit 0 = Tx Major Alarm Bits 1 – 7 = Spares 0 = Not Forced, 1 = Forced

<1>	Asynchronous In-Band Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	FSK Communications Select	0 = None, 1 = Codan, 2 = TerraSat, 3 = Amplus
<1>	FSK Test Type	0 = None, 1 = Loopback, 2 = Cycle TX Enable, 3 = Codan Pass thru, 4 = TerraSat pass thru, 5 = Amplus Pass thru, 6 = Query for address
<2>	BUC Address	
<1>	BUC Output Enable	0 = Disabled, 1 = Enabled
<1>	Minor Alarm Relay Usage	0 = undefined, 1= IBS Usage, 2 = IBS & Minor Alarms, 3 = IBS, Minor Alarms and Major Alarms
<1>	Ethernet QOS Type	0 = Normal, 1 = Port based
<1>	Ethernet QOS QUEUE	0 = Fair Weighted, 1 = Strict Priority
<1>	EBEM overhead channel rate	0 = Off, 1 = 8K, 2 = 16K, 3 = 24K, 4 = 32K, 5 = 40K, 6 = 48K, 7 = 56K, 8 = 64K
<1>	EBEM embedded channel	0 = Off, 1 = On
<1>	EBEM ITA	0 = Disabled, 1 = Enabled
<1>	EBEM encryption	0 = Disabled, 1 = Enabled
<4>	EBEM Ethernet rate	4800 to 52000000
<1>	Ethernet HDLC	0= Radyne, 1 = Comtech, 2 = Managed 570

Opcode: <2602h> Command a Modulator's Frequency

Command Data (4 Bytes)		
<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz NOTE ***This command also turns the carrier off to protect the satellite.***

Opcode: <2603h> Command a Modulator's Strap Code

Command Data (2 Bytes)		
<2>	Strap Code	Binary value NOTE ***This command also turns the carrier off to protect the satellite.***

Opcode: <2604h> Command a Modulator's Data Rate

Command Data (4 Bytes)

<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50  ***This command also turns the carrier off to protect the satellite.***

Opcode: <2605h> Command a Modulator's Filter Mask

Command Data (1 Byte)		
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35

Opcode: <2606h> Command a Modulator's Modulation Type

Command Data (1 Byte)		
<1>	Modulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM  ***This command also turns the carrier off to protect the satellite.***

Opcode: <2607h> Command a Modulator's Convolutional Encoder

Command Data (1 Byte)		
<1>	Convolutional Encoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5  ***This command also turns the carrier off to protect the satellite.***

Opcode: <2608h> Command a Modulator's Differential Encoder

Command Data (1 Byte)		
<1>	Differential Encoder	0 = Disabled, 1 = Enabled

Opcode: <2609h> Command a Modulator's Carrier Control

Command Data (1 Byte)		
<1>	Carrier Control	0 = Off, 1 = On, 2 = Auto, 3 = VSAT, 4 = RTS (Refer To Appendix E)

Opcode: <260Ah> Command a Modulator's Carrier Selection

Command Data (1 Byte)		
<1>	Carrier Selection	0 = Normal, 1 = CW, 2 = Dual, 3 = Offset, 4 = Pos Fir, 5 = Neg Fir

Opcode: <260Bh> Command a Modulator's Clock Control

Command Data (1 Byte)		
<1>	Clock Control	0 = SCTE, 1 = SCT

Opcode: <260Ch> Command a Modulator's Clock Polarity

Command Data (1 Byte)		
<1>	Clock Polarity	0 = Normal, 1 = Inverted, 2 = Auto

Opcode: <260Dh> Command a Modulator's SCT Source

Command Data (1 Byte)		
<1>	SCT Source	0 = Internal, 1 = SCR

Opcode: <260Eh> Command a Modulator's Drop Mode

Command Data (1 Byte)		
<1>	Drop Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S

Opcode: <260Fh> Command a Modulator's Output Level

Command Data (2 Bytes)		
<2>	Transmit Power Level	For DMD20 Signed value, 0 to -250 (0.0 to -25.0 dBm) (two's compliment) For OM20 Signed value, -200 to -450 (-20.0 to -45.0 dBm) For DMD2050E Signed value. 0 to -450 (0.0 to -45.0 dBM)

Opcode: <2610h> Command a Modulator's Reed-Solomon

Command Data (1 Byte)

<1>	Reed Solomon	0 = Disabled, 1 = Enabled NOTE ***This command also turns the Carrier off.***

Opcode: <2611h> Command a Modulator's Spectrum

Command Data (1 Byte)		
<1>	Spectrum	0 = Normal, 1 = Inverted

Opcode: <2612h> Command a Modulator's TX Test Pattern

Command Data (1 Byte)		
<1>	TX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1

Opcode: <2613h> Command a Modulator's Scrambler Control

Command Data (1 Byte)		
<1>	Scrambler Control	0 = Disabled, 1 = Enabled

Opcode: <2614h> Command a Modulator's Scrambler Type

Command Data (1 Byte)		
<1>	Scrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync

Opcode: <2615h> Command a Modulator's Satellite Framing

Command Data (1 Byte)		
<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem NOTE ***This command also turns the carrier off to protect the satellite.***

Opcode: <2616h> Command a Modem's Frequency Reference Source

Command Data (1 Byte)		
<1>	Frequency Reference Source	0 = Internal, 1 = External, 2 = High stability

Opcode: <2617h> Command a Modulator's Terrestrial Loopback

Command Data (1 Byte)

<1>	Tx Terrestrial Loopback	0 = Disabled, 1 = Enabled

Opcode: <2618h> Command a Modulator's Baseband Loopback

Command Data (1 Byte)		
<1>	Tx Baseband Loopback	0 = Disabled, 1 = Enabled

Opcode: <2619h> Command a Modulator's Network Specification

Command Data (1 Byte)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem

Opcode: <261Ah> Command a Modem's External Clock Frequency

Command Data (4 Bytes)		
<4>	External Clock Frequency	Binary value, 1 Hz steps 2.4 kHz to 20 MHz For DMD20 2.4 kHz to 52 MHz For DMD2050, DMD2050E and DMD50

Opcode: <261Bh> Command a Modem's External Reference Frequency

Command Data (4 Bytes)		
<4>	External Reference Frequency	Binary value, 8 kHz steps, 256 kHz to 10 MHz

Opcode: <261Dh> Command a Modulator's T1D4 Yellow Alarm Selection

Command Data (1 Byte)		
<1>	T1D4 Yellow Alarm Select	Reserved

Opcode: <261Eh> Command a Modulator's Interface Type

Command Data (1 Byte)		
<1>	Tx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3

Opcode: <261Fh> Command a Modulator's Circuit ID

Command Data (11 Bytes)

<11>	Tx Circuit ID	11 ASCII characters, null terminated

Opcode: <2622h> Command Force Modulator Alarm Test

Command Data (1 Byte)		
<1>	Forced Alarm Test	Bit 0 = Tx Major Alarm Bits 1 – 7 = Spares 0 = Not Forced, 1 = Forced

Opcode: <2623h> Command Modulator Data Invert

Command Data (1 Byte)		
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband

Opcode: <2625h> Clear a Modulator's Latched Alarm 1 (No Data)

Command Data (0 Bytes)

Opcode: <2629h> Command AUPC Local Enable

Command Data (1 Byte)		
<1>	AUPC Local Enable	0 = Off, 1 = EF AUPC, 2 = Radyne AUPC

Opcode: <262Ah> Command AUPC Remote Enable

Command Data (1 Byte)		
<1>	AUPC Remote Enable	0 = Off, 1 = EF AUPC

Opcode: <262Bh> Command AUPC Local CL Action

Command Data (1 Byte)		
<1>	AUPC Local CL Action	0 = Hold, 1 = Nominal, 2 = Maximum

Opcode: <262Ch> Command AUPC Remote CL Action

Command Data (1 Byte)		
<1>	AUPC Remote CL Action	0 = Hold, 1 = Nominal, 2 = Maximum

Opcode: <262Dh> Command AUPC Tracking Rate

Command Data (1 Byte)		
<1>	AUPC Tracking Rate	0 = 0.5 dB/Min, 1 = 1.0 dB/Min, 2 = 1.5 dB/Min, 3 = 2.0 dB/Min, 4 = 2.5 dB/Min, 5 = 3.0 dB/Min, 6 = 3.5 dB/Min, 7 = 4.0 dB/Min, 8 = 4.5 dB/Min, 9 = 5.0 dB/Min, 10 = 5.5 dB/Min, 11 = 6.0 dB/min

Opcode: <262Eh> Command AUPC Remote Baseband Loopback

Command Data (1 Byte)		
<1>	AUPC Remote BB Loopback	0 = Disabled, 1 = Enabled

Opcode: <262Fh> Command AUPC Remote Test 2047

Command Data (1 Byte)		
<1>	AUPC Remote 2047	0 = Disabled, 1 = Enabled

Opcode: <2630h> Command AUPC Eb/No

Command Data (2 Bytes)		
<2>	AUPC Target Eb/No	Target Eb/No at Receiver, 400 to 2000 (4.00 db to 20.00 db)

Opcode: <2631h> Command AUPC Minimum Power

Command Data (2 Bytes)		
<2>	AUPC Minimum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)

Opcode: <2632h> Command AUPC Maximum Power

Command Data (2 Bytes)		
<2>	AUPC Maximum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)

Opcode: <2633h> Command AUPC Nominal Power

Command Data (2 Bytes)		
<2>	AUPC Nominal Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)

Opcode: <2634h> Command AUPC Local Configuration

Command Data (12 Bytes)		
<1>	AUPC Local Enable	0 = Off, 1 = EF AUPC, 2 = Radyne AUPC
<1>	AUPC Local CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<1>	AUPC Tracking Rate	0 = 0.5 dB/Min, 1 = 1.0 dB/Min, 2 = 1.5 dB/Min, 3 = 2.0 dB/Min, 4 = 2.5 dB/Min, 5 = 3.0 dB/Min, 6 = 3.5 dB/Min, 7 = 4.0 dB/Min, 8 = 4.5 dB/Min, 9 = 5.0 dB/Min, 10 = 5.5 dB/Min, 11 = 6.0 dB/min
<1>	AUPC Remote CL Action	0 = Hold, 1 = Nominal, 2 = Maximum
<2>	AUPC Target Eb/No	Target Eb/No at Receiver, 400 to 2000 (4.00 db to 20.00 db)

<2>	AUPC Minimum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Maximum Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)
<2>	AUPC Nominal Power	For DMD20 Signed value 0 to –2500 with implied decimal point; (0.00 to –25.00 dBm) (two's compliment) For OM20 Signed value -2000 to -4500 with implied decimal point; (-20.00 to -45.00 dBm)

Opcode: <2635h> Command AUPC Remote Configuration

Command Data (3 Bytes)		
<1>	AUPC Remote Enable	0 = Off, 1 = EF AUPC
<1>	AUPC Remote BB Loopback	0 = Disabled, 1 = Enabled
<1>	AUPC Remote 2047	0 = Disabled, 1 = Enabled

Opcode: <2636h> Command Modulator Reed Solomon N & K Codes and Interleaver Depth

Command Data (3 Bytes)		
<1>	Tx RS N Code	2 – 255, Reed-Solomon code word length
<1>	Tx RS K Code	1 – 254, Reed-Solomon message length
<1>	Tx RS Depth	4, 8, or 12

Opcode: <2638h> Command Modulator TPC Interleaver

Command Data (1 Byte)		
<1>	TPC Interleaver	0 = Disabled, 1 = Enabled

Opcode: <2640h> Command Modulator Async Configuration

Command Data (4 Bytes)		
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS232, 1 = RS485
<1>	ES Baud Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 bits, 1 = 8 bits

Opcode: <2641h> Command Minor Alarm Relay Usage

Command Data (1 Byte)		
<1>	Minor Alarm Relay Usage	0 = undefined, 1= IBS Usage, 2 = IBS & Minor Alarms, 3 = IBS, Minor Alarms and Major Alarms

Opcode: <2642h> Command Modulator Ethernet Terrestrial Interface Configuration

Command Data (4 Bytes)

<1>	Ethernet Flow Control	0 = Disabled, 1 = Enabled
<1>	Ethernet Daisy Chain	0 = Disabled, 1 = Port 4
<1>	Ethernet QOS Type	0 = Normal, 1 = Port based
<1>	Ethernet QOS QUEUE	0 = Fair Weighted, 1 = Strict Priority

1.5.2 DMD20 Demodulator:

Opcode: <2401h> Query a Demodulator's Configuration and Status

Query Response (237 Bytes)		
<1>	Number of nonvol bytes	Number of Configuration Bytes
Configuration Bytes (148 Nonvol Bytes)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem
<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz
<2>	Sweep Delay	Binary value, 0.1 second steps, Implied decimal point, 0 – 65535 (0.0 sec to 6553.5 sec)
<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50
<1>	Sweep Boundary	Sweep limits. Max of ± 255 kHz in kHz steps 0 - 255
<1>	Input Level Limit	Lower level limit, binary value, 1 dB steps, and Implied sign. 30 to 90 (-30 to –90 dBm)
<2>	Strap Code	Binary value
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35
<1>	Demodulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM
<1>	Convolutional Decoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5
<1>	Reed Solomon	0 = Disabled, 1 = Enabled
<1>	Differential Decoder	0 = Disabled, 1 = Enabled
<1>	Descrambler Control	0 = Disabled, 1 = Enabled

<1>	Descrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync
<1>	Spectrum	0 = Normal, 1 = Inverted
<1>	Buffer Size msec	Indicates buffer size in msecs, 0 through 64
<1>	Active Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI
<1>	Buffer Clock Polarity	0 = Normal, 1 = Inverted
<1>	Insert Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S
<1>	T1E1 Frame Source	0 = Internal, 1 = External, 2 = IDI/DDO Loopback
<30>	Insert Map	Timeslots to insert organized by satellite channel (Mapping of Satellite channels 1 thru 30 to inserted Terrestrial Timeslots (Terrestrial Timeslots = 1..31) (0 = Insert None))
<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem
<1>	RX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1
<1>	Map Summary To Backward Alarm	0 = None, 1 = BK1, 2 = BK2, 3 = BK1 & 2, 4 = BK3, 5 = BK1 & 3, 6 = BK2 & 3, 7 = BK1, 2 & 3, 8 = BK4, 9 = BK1 & 4, 10 = BK2 & 4, 11 = BK1, 2 & 4, 12 = BK3 & 4, 13 = BK1, 3 & 4, 14 = BK2, 3 & 4, 15 = BK1, 2, 3 & 4
<1>	Force Alarm Test	0 = None, 1 = Send the Alarm Bit 0 = Rx Major Alarm Bits 1 - 7 = Spares
<1>	Alarm 1 Mask	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Mask, 1 = Allow
<1>	Alarm 2 Mask	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Mask, 1 = Allow

<1>	Alarm 3 Mask	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Mask, 1 = Allow
<1>	Alarm 4 Mask	Bit 0 = Buffer Clock Activity Detect Bit 1 = External BNC Activity Detect Bit 2 = Rx Satellite Clock Activity Detect Bit 3 = Insert Clock Activity Detect Bit 4 = External Reference Activity Detect Bit 5 = High Stability Reference PLL Activity Bit 6 = Reserved Bit 7 = Low EbNo 0 = Mask, 1 = Allow
<1>	Common Alarm 1 Mask	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	Common Alarm 2 Mask	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Mask, 1 = Allow
<1>	ESC Channel 1 Volume	Binary value, valid in IDR only, +10 dBm to –20 dBm (two's compliment)
<1>	ESC Channel 2 Volume	Binary value, valid in IDR only, +10 dBm to –20 dBm (two's compliment)
<1>	BER Exponent	6 through 9 for Viterbi, 5 through 7 for Sequential
<11>	Rx Circuit ID	11 ASCII characters, null terminated
<1>	Rx Terrestrial Loopback	0 = Disabled, 1 = Enabled
<1>	Rx Baseband Loopback	0 = Disabled, 1 = Enabled
<1>	Rx IF Loopback	0 = Disabled, 1 = Enabled

<1>	Rx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3
<1>	Insert Status Mask	Bit 0 = Frame lock Bit 1 = Multiframe lock. Valid in E1 PCM-30 and PCM-30C Bit 2 = CRC lock. Valid in T1ESF, and E1 CRC enabled Bits 3 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Rx RS N Code	2 - 255 Reed-Solomon code word length
<1>	Rx RS K Code	1 - 254 Reed-Solomon message length
<1>	Rx RS Depth	4, 8, or 12
<1>	External Clock Source	Reserved
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband
<1>	Alarm 5 Mask	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	BPSK Symbol Pairing	0 = Normal, 1 = Swapped
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS-232, 1 = RS-485
<1>	ES Baud	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 Bits, 1 = 8 Bits
<1>	IDR Overhead Type	0 = 32K Voice, 1 = 64K Data
<1>	FM Orderwire Mode	Reserved
<1>	TMT Pattern Length	Reserved
<1>	EbNo Threshold	Unsigned Binary Value, 0-99, Implied Decimal Point (0.0 through 9.9 dB)
<2>	Reacquisition Sweep Limit	Binary value, 1 Hz steps, 0 - 65535
<1>	Terrestrial Streaming	0 = Continuous, 1 = Burst
<1>	Terrestrial Framing	0 = DVB 188, 1 = DVB 204, 2 = NONE
<1>	Alarm 6 Mask	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Mask, 1 = Allow
<1>	TPC De-Interleaver	0 = Disabled, 1 = Enabled

<1>	SCC Control Ratio	1 = 1/1, 2 = 1/2, 3 = 1/3, 4 = 1/4, 5 = 1/5, 6 = 1/6, 7 = 1/7
<4>	SCC In band Rate	300 to 200000 bps
<1>	Fast Acquisition	0 = Disabled, 1 = Enabled
<1>	Adjacent Carrier Type	0 = Normal, 1 = High Power
<2>	LBST LNB DC Voltage Alarm Lower Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST LNB DC Voltage Alarm Upper Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST LNB DC Current Alarm Lower Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	LBST LNB DC Current Alarm Upper Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<1>	Number of Buffer Clock Sources	1 - 5
<1>	First Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Second Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Third Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Forth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Fifth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Asynchronous In-Band Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<2>	Rotation Ambiguity	0 = 0.0.0, 1 = 0.0.1, 2 = 0.1.0, 3 = 0.1.1, 4 = 1.0.0, 5 = 1.0.1, 6 = 1.1.0, 7 = 1.1.1
<2>	RFM AGC Time Constant	1 - 99999 in ms
<1>	Carrier-in-Carrier	0 = Disabled, 1 = Enabled
<2>	Carrier-in-Carrier Minimum Search Delay	0 – 330
<2>	Carrier-in-Carrier Maximum Search Delay	0 – 330
<1>	Carrier-in-Carrier Frequency Offset Range	0 – 30 (KHz)
<1>	EBEM overhead channel rate	0 = Off, 1 = 8K, 2 = 16K, 3 = 24K, 4 = 32K, 5 = 40K, 6 = 48K, 7 = 56K, 8 = 64K
<1>	EBEM embedded channel	0 = Off, 1 = On
<1>	EBEM ITA	0 = Disabled, 1 = Enabled
<1>	EBEM encryption	0 = Disabled, 1 = Enabled
<4>	EBEM Ethernet rate	4800 to 52000000

Status Bytes (88 Bytes)		
<1>	Control Mode	0 = Front Panel, 1 = Terminal, 2 = Computer, Note: DMD20 will always return 2 = Computer
<1>	Revision Number	Decimal point implied
<1>	Alarm 1	Bit 0 = Receive FPGA/Processor Fault, 1 = Fail Bit 1 = Carrier Loss, 1 = Fail Bit 2 = Multiframe Sync Loss, 1 = Fail Bit 3 = Frame Sync Loss, 1 = Fail Bit 4 = IBS BER Alarm, 1 = Fail Bit 5 = Satellite AIS, 1 = Fail Bit 6 = Rx Data Activity, 1 = Activity Bit 7 = Rx AGC Level, 1 = Fail
<1>	Alarm 2	Bit 0 = Buffer Underflow, 1 = Underflow Bit 1 = Buffer Overflow, 1 = Overflow Bit 2 = Buffer Under 10%, 1 = Fail Bit 3 = Buffer Over 90%, 1 = Fail Bit 4 = RS Decoder Lock Fault, 1 = Fail Bit 5 = RS De-Interleaver Fault, 1 = Fail Bit 6 = RS Decoder Uncorrectable Word, 1 = Fail Bit 7 = Demod Summary Fault, 1 = Fail
<1>	Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock, 1 = Lock Bit 1 = Insert DSP Config, 1 = Fail Bit 2 = Buffer Clock PLL Lock Detect, 1 = Lock Bit 3 = Viterbi Decoder Lock, 1 = Lock Bit 4 = Sequential Decoder Lock, 1 = Lock Bit 5 = Rx Test Pattern Lock, 1 = Lock Bit 6 = External Reference PLL Lock, 1 = Lock Bit 7 = Rx Carrier Level, 1 = Fail
<1>	Alarm 4	Bit 0 = Buffer Clock Activity Detect, 1 = Activity Bit 1 = External BNC Activity Detect, 1 = Activity Bit 2 = Rx Satellite Clock Activity Detect, 1 = Activity Bit 3 = Insert Clock Activity Detect, 1 = Activity Bit 4 = External Reference Activity Detect, 1 = Activity Bit 5 = High Stability Reference PLL Activity, 1 = Activity Bit 6 = Reserved Bit 7 = Low EbNo, 1 = Fail
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare
<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail

<1>	Latched Alarm 1	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 2	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched
<1>	Backward Alarms	Bit 0 = Backward Alarm 1 IDR Bit 1 = Backward Alarm 2 IDR Bit 2 = Backward Alarm 3 IDR Bit 3 = Backward Alarm 4 IDR Bits 4 – 7 = Reserved 0 = No, 1 = Yes
<4>	Error Counter	Binary value
<4>	Test Error Counter	Binary value
<2>	Raw BER Mantissa	Bytes 1 - 2 = Binary value Raw BER; 896 = 8.96
<2>	Corrected BER Mantissa	Bytes 1 - 2 = Binary value corrected BER
<2>	EbNo	Binary value, 1 decimal point implied; 700 = 7.00

<4>	Offset Frequency	Binary value, 1 Hz steps
<2>	Test BER Mantissa	Bytes 1 - 2 = Binary value test BER
<1>	Raw BER Exponent	Byte 3 = Binary value exponent
<1>	Corrected BER Exponent	Byte 3 = Binary value exponent
<1>	Test BER Exponent	Byte 3 = Binary value exponent
<1>	Offset Frequency Sign	If <> 0, '-' offset
<1>	BER/EbNo Status	Bit 0 = Raw BER and corrected BER status. 1 = Valid Bit 1 = Test BER status. 1 = Valid Bits 2 - 3 = EbNo status, 0 = EbNo is invalid, 1 = EbNo is valid, 2 = EbNo is smaller than indicated value, 3 = EbNo is greater than indicated value Bit 4 = BER Counter Overflow. 1 = Overflow Condition Bit 5 = Test BER Counter Overflow. 1 = Overflow Condition Bits 6 – 7 = Reserved
<1>	Buffer Percent Full	Binary value representing % buffer full, 0 - 100 in 1% steps
<1>	Input Level	Binary value in 1 dB steps, implied sign
<1>	Insert Status Fault	Bit 0 = Frame lock fault. 1 = Fail Bit 1 = Multiframe lock fault. Valid in E1 PCM-30 and PCM-30C. 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled. 1 = Fail Bits 3 – 7 = Reserved
<1>	Online Flag	Online Switch Status: 0 = Offline, 1 = Online (DMD20 is always online)
<1>	Loss Flag	1 = Loss of IDI Signal, DMD20
<1>	Alarm 5	Bit 0 = Trellis Decoder Lock, 1 = Lock Bit 1 = IFEC Alarm, 1 = fail Bit 2 = T1/E1 Signaling, 1 = Fail Bit 3 = TPC Conflict Check, 1 = Fail Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = Spare
<1>	Latched Alarm 4	Bits 0 – 6 = Reserved Bit 7 = Low EbNo 0 = Not Latched, 1 = Latched
<4>	Symbol Rate	Binary value, 1 sps steps
<1>	Latched Alarm 5	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Alarm 6	Bit 0 = LBST LNB DC Current Alarm, 1 = Fail Bit 1 = LBST LNB DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bits 3 – 7 = Spares

<1>	Latched Alarm 6	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Not Latched, 1 = Latched
<2>	LBST LNB DC Current	Amps, Implied decimal point, 1000 = 1.000A
<2>	LBST LNB DC Voltage	Volts, Implied decimal point, 10 = 1.0V
<2>	Ethernet Bridge PER Mantissa	Bytes 1 - 2 = Binary value of Packet Error Rate
<1>	Ethernet Bridge PER Exponent	Byte 3 = Binary exponent of Packet Error Rate
<4>	Ethernet Bridge Packet Error Count	Binary Value
<4>	Ethernet Bridge Packet Total Count	Binary Value
<1>	Ethernet Bridge Port 1 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 2 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 3 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 4 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge WAN Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<4>	RFM AGC Voltage	Rx AGC Voltage Level in Volts. There is an implied decimal point. A value of 450 corresponds to 4.50V
<1>	RFM AGC Voltage Sign	If <> 0, '-' AGC Voltage
<4>	Carrier-in-Carrier Run Time Delay	Delay in µsec X 10
<4>	Carrier-in-Carrier Run Time Frequency Offset	Offset in KHz X 10
<2>	Carrier-in-Carrier Ratio	Ratio in dB

Opcode: <2449h> Query a Demodulator's Configuration

Query Response (148 Bytes)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem

<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz
<2>	Sweep Delay	Binary value, 0.1 second steps, Implied decimal point, 0 – 65535 (0.0 sec to 6553.5 sec)
<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50
<1>	Sweep Boundary	Sweep limits. Max of ± 255 kHz in kHz steps 0 - 255
<1>	Input Level Limit	Lower level limit, binary value, 1 dB steps, and Implied sign. 30 to 90 (-30 to –90 dBm)
<2>	Strap Code	Binary value
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35
<1>	Demodulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM
<1>	Convolutional Decoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5
<1>	Reed Solomon	0 = Disabled, 1 = Enabled
<1>	Differential Decoder	0 = Disabled, 1 = Enabled
<1>	Descrambler Control	0 = Disabled, 1 = Enabled
<1>	Descrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync
<1>	Spectrum	0 = Normal, 1 = Inverted
<1>	Buffer Size msec	Indicates buffer size in msecs, 0 through 64
<1>	Active Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI
<1>	Buffer Clock Polarity	0 = Normal, 1 = Inverted
<1>	Insert Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S
<1>	T1E1 Frame Source	0 = Internal, 1 = External, 2 = IDI/DDO Loopback
<30>	Insert Map	Timeslots to insert organized by satellite channel (Mapping of Satellite channels 1 thru 30 to inserted Terrestrial Timeslots (Terrestrial Timeslots = 1..31) (0 = Insert None))

<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem
<1>	RX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1
<1>	Map Summary To Backward Alarm	0 = None, 1 = BK1, 2 = BK2, 3 = BK1 & 2, 4 = BK3, 5 = BK1 & 3, 6 = BK2 & 3, 7 = BK1, 2 & 3, 8 = BK4, 9 = BK1 & 4, 10 = BK2 & 4, 11 = BK1, 2 & 4, 12 = BK3 & 4, 13 = BK1, 3 & 4, 14 = BK2, 3 & 4, 15 = BK1, 2, 3 & 4
<1>	Force Alarm Test	0 = None, 1 = Send the Alarm Bit 0 = Rx Major Alarm Bits 1 - 7 = Spares
<1>	Alarm 1 Mask	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Mask, 1 = Allow
<1>	Alarm 2 Mask	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Mask, 1 = Allow
<1>	Alarm 3 Mask	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Mask, 1 = Allow
<1>	Alarm 4 Mask	Bit 0 = Buffer Clock Activity Detect Bit 1 = External BNC Activity Detect Bit 2 = Rx Satellite Clock Activity Detect Bit 3 = Insert Clock Activity Detect Bit 4 = External Reference Activity Detect Bit 5 = High Stability Reference PLL Activity Bit 6 = Reserved Bit 7 = Low EbNo 0 = Mask, 1 = Allow
<1>	Common Alarm 1 Mask	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Mask, 1 = Allow

<1>	Common Alarm 2 Mask	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Mask, 1 = Allow
<1>	ESC Channel 1 Volume	Binary value, valid in IDR only, +10 dBm to –20 dBm (two's compliment)
<1>	ESC Channel 2 Volume	Binary value, valid in IDR only, +10 dBm to –20 dBm (two's compliment)
<1>	BER Exponent	6 through 9 for Viterbi, 5 through 7 for Sequential
<11>	Rx Circuit ID	11 ASCII characters, null terminated
<1>	Rx Terrestrial Loopback	0 = Disabled, 1 = Enabled
<1>	Rx Baseband Loopback	0 = Disabled, 1 = Enabled
<1>	Rx IF Loopback	0 = Disabled, 1 = Enabled
<1>	Rx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3
<1>	Insert Status Mask	Bit 0 = Frame lock Bit 1 = Multiframe lock. Valid in E1 PCM-30 and PCM-30C Bit 2 = CRC lock. Valid in T1ESF, and E1 CRC enabled Bits 3 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Rx RS N Code	2 - 255 Reed-Solomon code word length
<1>	Rx RS K Code	1 - 254 Reed-Solomon message length
<1>	Rx RS Depth	4, 8, or 12
<1>	External Clock Source	Reserved
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband
<1>	Alarm 5 Mask	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	BPSK Symbol Pairing	0 = Normal, 1 = Swapped
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS-232, 1 = RS-485

<1>	ES Baud	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 Bits, 1 = 8 Bits
<1>	IDR Overhead Type	0 = 32K Voice, 1 = 64K Data
<1>	FM Orderwire Mode	Reserved
<1>	TMT Pattern Length	Reserved
<1>	EbNo Threshold	Unsigned Binary Value, 0-99, Implied Decimal Point (0.0 through 9.9 dB)
<2>	Reacquisition Sweep Limit	Binary value, 1 Hz steps, 0 - 65535
<1>	Terrestrial Streaming	0 = Continuous, 1 = Burst
<1>	Terrestrial Framing	0 = DVB 188, 1 = DVB 204, 2 = NONE
<1>	Alarm 6 Mask	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Mask, 1 = Allow
<1>	TPC De-Interleaver	0 = Disabled, 1 = Enabled
<1>	SCC Control Ratio	1 = 1/1, 2 = 1/2, 3 = 1/3, 4 = 1/4, 5 = 1/5, 6 = 1/6, 7 = 1/7
<4>	SCC In band Rate	300 to 200000 bps
<1>	Fast Acquisition	0 = Disabled, 1 = Enabled
<1>	Adjacent Carrier Type	0 = Normal, 1 = High Power
<2>	LBST LNB DC Voltage Alarm Lower Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST LNB DC Voltage Alarm Upper Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST LNB DC Current Alarm Lower Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	LBST LNB DC Current Alarm Upper Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<1>	Number of Buffer Clock Sources	1 - 5
<1>	First Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Second Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Third Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Forth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Fifth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Asynchronous In-Band Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<2>	Rotation Ambiguity	0 = 0.0.0, 1 = 0.0.1, 2 = 0.1.0, 3 = 0.1.1, 4 = 1.0.0, 5 = 1.0.1, 6 = 1.1.0, 7 = 1.1.1

<2>	RFM AGC Time Constant	1 - 99999 in ms
<1>	Carrier-in-Carrier	0 = Disabled, 1 = Enabled
<2>	Carrier-in-Carrier Minimum Search Delay	0 – 330
<2>	Carrier-in-Carrier Maximum Search Delay	0 – 330
<1>	Carrier-in-Carrier Frequency Offset Range	0 – 30 (KHz)
<1>	EBEM overhead channel rate	0 = Off, 1 = 8K, 2 = 16K, 3 = 24K, 4 = 32K, 5 = 40K, 6 = 48K, 7 = 56K, 8 = 64K
<1>	EBEM embedded channel	0 = Off, 1 = On
<1>	EBEM ITA	0 = Disabled, 1 = Enabled
<1>	EBEM encryption	0 = Disabled, 1 = Enabled
<4>	EBEM Ethernet rate	4800 to 52000000

Opcode: <240Ch> Query a Demodulator's Status

Query Response (88 Bytes)		
<1>	Control Mode	0 = Front Panel, 1 = Terminal, 2 = Computer, Note: DMD20 will always return 2 = Computer
<1>	Revision Number	Decimal point implied
<1>	Alarm 1	Bit 0 = Receive FPGA/Processor Fault, 1 = Fail Bit 1 = Carrier Loss, 1 = Fail Bit 2 = Multiframe Sync Loss, 1 = Fail Bit 3 = Frame Sync Loss, 1 = Fail Bit 4 = IBS BER Alarm, 1 = Fail Bit 5 = Satellite AIS, 1 = Fail Bit 6 = Rx Data Activity, 1 = Activity Bit 7 = Rx AGC Level, 1 = Fail
<1>	Alarm 2	Bit 0 = Buffer Underflow, 1 = Underflow Bit 1 = Buffer Overflow, 1 = Overflow Bit 2 = Buffer Under 10%, 1 = Fail Bit 3 = Buffer Over 90%, 1 = Fail Bit 4 = RS Decoder Lock Fault, 1 = Fail Bit 5 = RS De-Interleaver Fault, 1 = Fail Bit 6 = RS Decoder Uncorrectable Word, 1 = Fail Bit 7 = Demod Summary Fault, 1 = Fail
<1>	Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock, 1 = Lock Bit 1 = Insert DSP Config, 1 = Fail Bit 2 = Buffer Clock PLL Lock Detect, 1 = Lock Bit 3 = Viterbi Decoder Lock, 1 = Lock Bit 4 = Sequential Decoder Lock, 1 = Lock Bit 5 = Rx Test Pattern Lock, 1 = Lock Bit 6 = External Reference PLL Lock, 1 = Lock Bit 7 = Rx Carrier Level, 1 = Fail

<1>	Alarm 4	Bit 0 = Buffer Clock Activity Detect, 1 = Activity Bit 1 = External BNC Activity Detect, 1 = Activity Bit 2 = Rx Satellite Clock Activity Detect, 1 = Activity Bit 3 = Insert Clock Activity Detect, 1 = Activity Bit 4 = External Reference Activity Detect, 1 = Activity Bit 5 = High Stability Reference PLL Activity, 1 = Activity Bit 6 = Reserved Bit 7 = Low EbNo, 1 = Fail
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare
<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail
<1>	Latched Alarm 1	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 2	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Not Latched, 1 = Latched

<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched
<1>	Backward Alarms	Bit 0 = Backward Alarm 1 IDR Bit 1 = Backward Alarm 2 IDR Bit 2 = Backward Alarm 3 IDR Bit 3 = Backward Alarm 4 IDR Bits 4 – 7 = Reserved 0 = No, 1 = Yes
<4>	Error Counter	Binary value
<4>	Test Error Counter	Binary value
<2>	Raw BER Mantissa	Bytes 1 - 2 = Binary value Raw BER; 896 = 8.96
<2>	Corrected BER Mantissa	Bytes 1 - 2 = Binary value corrected BER
<2>	EbNo	Binary value, 1 decimal point implied; 700 = 7.00
<4>	Offset Frequency	Binary value, 1 Hz steps
<2>	Test BER Mantissa	Bytes 1 - 2 = Binary value test BER
<1>	Raw BER Exponent	Byte 3 = Binary value exponent
<1>	Corrected BER Exponent	Byte 3 = Binary value exponent
<1>	Test BER Exponent	Byte 3 = Binary value exponent
<1>	Offset Frequency Sign	If <> 0, '-' offset
<1>	BER/EbNo Status	Bit 0 = Raw BER and corrected BER status. 1 = Valid Bit 1 = Test BER status. 1 = Valid Bits 2 - 3 = EbNo status, 0 = EbNo is invalid, 1 = EbNo is valid, 2 = EbNo is smaller than indicated value, 3 = EbNo is greater than indicated value Bit 4 = BER Counter Overflow. 1 = Overflow Condition Bit 5 = Test BER Counter Overflow. 1 = Overflow Condition Bits 6 – 7 = Reserved
<1>	Buffer Percent Full	Binary value representing % buffer full, 0 - 100 in 1% steps
<1>	Input Level	Binary value in 1 dB steps, implied sign
<1>	Insert Status Fault	Bit 0 = Frame lock fault. 1 = Fail Bit 1 = Multiframe lock fault. Valid in E1 PCM-30 and PCM-30C. 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled. 1 = Fail Bits 3 – 7 = Reserved

<1>	Online Flag	Online Switch Status: 0 = Offline, 1 = Online (DMD20 is always online)
<1>	Loss Flag	1 = Loss of IDI Signal, DMD20
<1>	Alarm 5	Bit 0 = Trellis Decoder Lock, 1 = Lock Bit 1 = IFEC Alarm, 1 = fail Bit 2 = T1/E1 Signaling, 1 = Fail Bit 3 = TPC Conflict Check, 1 = Fail Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = Spare
<1>	Latched Alarm 4	Bits 0 – 6 = Reserved Bit 7 = Low EbNo 0 = Not Latched, 1 = Latched
<4>	Symbol Rate	Binary value, 1 sps steps
<1>	Latched Alarm 5	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Alarm 6	Bit 0 = LBST LNB DC Current Alarm, 1 = Fail Bit 1 = LBST LNB DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bits 3 – 7 = Spares
<1>	Latched Alarm 6	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Not Latched, 1 = Latched
<2>	LBST LNB DC Current	Amps, Implied decimal point, 1000 = 1.000A
<2>	LBST LNB DC Voltage	Volts, Implied decimal point, 10 = 1.0V
<2>	Ethernet Bridge PER Mantissa	Bytes 1 - 2 = Binary value of Packet Error Rate
<1>	Ethernet Bridge PER Exponent	Byte 3 = Binary exponent of Packet Error Rate
<4>	Ethernet Bridge Packet Error Count	Binary Value
<4>	Ethernet Bridge Packet Total Count	Binary Value
<1>	Ethernet Bridge Port 1 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 2 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 3 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full

<1>	Ethernet Bridge Port 4 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge WAN Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<4>	RFM AGC Voltage	Rx AGC Voltage Level in Volts. There is an implied decimal point. A value of 450 corresponds to 4.50V
<1>	RFM AGC Voltage Sign	If <> 0, '-' AGC Voltage
<4>	Carrier-in-Carrier Run Time Delay	Delay in µsec X 10
<4>	Carrier-in-Carrier Run Time Frequency Offset	Offset in KHz X 10
<2>	Carrier-in-Carrier Ratio	Ratio in dB

Opcode: <2406h> Query a Demodulator's Latched Alarms

Query Response (8 Bytes)		
<1>	Latched Alarm 1	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 2	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Not Latched, 1 = Latched

<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 4	Bits 0 – 6 = Reserved Bit 7 = Low EbNo 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 5	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Alarm 6	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Not Latched, 1 = Latched

Opcode: <2409h> Query a Demodulator's Current Alarms

Query Response (9 Bytes)		
<1>	Alarm 1	Bit 0 = Receive FPGA/Processor Fault, 1 = Fail Bit 1 = Carrier Loss, 1 = Fail Bit 2 = Multiframe Sync Loss, 1 = Fail Bit 3 = Frame Sync Loss, 1 = Fail Bit 4 = IBS BER Alarm, 1 = Fail Bit 5 = Satellite AIS, 1 = Fail Bit 6 = Rx Data Activity, 1 = Activity Bit 7 = Rx AGC Level, 1 = Fail
<1>	Alarm 2	Bit 0 = Buffer Underflow, 1 = Underflow Bit 1 = Buffer Overflow, 1 = Overflow Bit 2 = Buffer Under 10%, 1 = Fail Bit 3 = Buffer Over 90%, 1 = Fail Bit 4 = RS Decoder Lock Fault, 1 = Fail Bit 5 = RS De-Interleaver Fault, 1 = Fail Bit 6 = RS Decoder Uncorrectable Word, 1 = Fail Bit 7 = Demod Summary Fault, 1 = Fail

<1>	Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock, 1 = Lock Bit 1 = Insert DSP Config, 1 = Fail Bit 2 = Buffer Clock PLL Lock Detect, 1 = Lock Bit 3 = Viterbi Decoder Lock, 1 = Lock Bit 4 = Sequential Decoder Lock, 1 = Lock Bit 5 = Rx Test Pattern Lock, 1 = Lock Bit 6 = External Reference PLL Lock, 1 = Lock Bit 7 = Rx Carrier Level, 1 = Fail
<1>	Alarm 4	Bit 0 = Buffer Clock Activity Detect, 1 = Activity Bit 1 = External BNC Activity Detect, 1 = Activity Bit 2 = Rx Satellite Clock Activity Detect, 1 = Activity Bit 3 = Insert Clock Activity Detect, 1 = Activity Bit 4 = External Reference Activity Detect, 1 = Activity Bit 5 = High Stability Reference PLL Activity, 1 = Activity Bit 6 = Reserved Bit 7 = Low EbNo, 1 = Fail
<1>	Insert Status Fault	Bit 0 = Frame lock fault. 1 = Fail Bit 1 = Multiframe lock fault. Valid in E1 PCM-30 and PCM-30C, 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled. 1 = Fail Bits 3 – 7 = Reserved
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare
<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail
<1>	Alarm 5	Bit 0 = Trellis Decoder Lock, 1 = Lock Bit 1 = IFEC Alarm, 1 = fail Bit 2 = T1/E1 Signaling, 1 = Fail Bit 3 = TPC Conflict Check, 1 = Fail Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = Spare
<1>	Alarm 6	Bit 0 = LBST LNB DC Current Alarm, 1 = Fail Bit 1 = LBST LNB DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bits 3 – 7 = Spares

Opcode: <2452h> Query a Demodulator's Async Configuration

Query Response (4 Bytes)		
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS-232, 1 = RS-485

<1>	ES Baud	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 Bits, 1 = 8 Bits

Opcode: <2494h> Query Demodulator's Ethernet Terrestrial Interface Packet Status

Query Response (16 Bytes)		
<2>	Ethernet Bridge PER Mantissa	Bytes 1 - 2 = Binary value of Packet Error Rate
<1>	Ethernet Bridge PER Exponent	Byte 3 = Binary exponent of Packet Error Rate
<4>	Ethernet Bridge Packet Error Count	Binary value
<4>	Ethernet Bridge Packet Total Count	Binary value
<1>	Ethernet Bridge Port 1 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 2 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 3 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge Port 4 Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full
<1>	Ethernet Bridge WAN Status	0 = Down, 1 = Unresolved, 2 = 10 Mbps Half, 3 = 100 Mbps Half, 4 = 10 Mbps Full, 5 = 100 Mbps Full, 6 = Port Not Used, 7 = 1000 Mbps Half, 8 = 1000 Mbps Full

Opcode: <2495h> Query Demodulator's CNC Status

Query Response (10 Bytes)		
<4>	Carrier-in-Carrier Run Time Delay	Delay in µsec X 10
<4>	Carrier-in-Carrier Run Time Frequency Offset	Offset in KHz X 10
<2>	Carrier-in-Carrier Ratio	Ratio in dB

Opcode: <2A00h> Command a Demodulator's Configuration

Command Data (148 Bytes)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem

<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz
<2>	Sweep Delay	Binary value, 0.1 second steps, Implied decimal point, 0 – 65535 (0.0 sec to 6553.5 sec)
<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50
<1>	Sweep Boundary	Sweep limits. Max of ± 255 kHz in kHz steps 0 - 255
<1>	Input Level Limit	Lower level limit, binary value, 1 dB steps, and Implied sign. 30 to 90 (-30 to –90 dBm)
<2>	Strap Code	Binary value
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35
<1>	Demodulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM
<1>	Convolutional Decoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5
<1>	Reed Solomon	0 = Disabled, 1 = Enabled
<1>	Differential Decoder	0 = Disabled, 1 = Enabled
<1>	Descrambler Control	0 = Disabled, 1 = Enabled
<1>	Descrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync
<1>	Spectrum	0 = Normal, 1 = Inverted
<1>	Buffer Size msec	Indicates buffer size in msecs, 0 through 64
<1>	Active Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI
<1>	Buffer Clock Polarity	0 = Normal, 1 = Inverted
<1>	Insert Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S
<1>	T1E1 Frame Source	0 = Internal, 1 = External, 2 = IDI/DDO Loopback
<30>	Insert Map	Timeslots to insert organized by satellite channel (Mapping of Satellite channels 1 thru 30 to inserted Terrestrial Timeslots (Terrestrial Timeslots = 1..31) (0 = Insert None))

<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem
<1>	RX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1
<1>	Map Summary To Backward Alarm	0 = None, 1 = BK1, 2 = BK2, 3 = BK1 & 2, 4 = BK3, 5 = BK1 & 3, 6 = BK2 & 3, 7 = BK1, 2 & 3, 8 = BK4, 9 = BK1 & 4, 10 = BK2 & 4, 11 = BK1, 2 & 4, 12 = BK3 & 4, 13 = BK1, 3 & 4, 14 = BK2, 3 & 4, 15 = BK1, 2, 3 & 4
<1>	Force Alarm Test	0 = None, 1 = Send the Alarm Bit 0 = Rx Major Alarm Bits 1 - 7 = Spares
<1>	Alarm 1 Mask	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Mask, 1 = Allow
<1>	Alarm 2 Mask	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Mask, 1 = Allow
<1>	Alarm 3 Mask	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Mask, 1 = Allow
<1>	Alarm 4 Mask	Bit 0 = Buffer Clock Activity Detect Bit 1 = External BNC Activity Detect Bit 2 = Rx Satellite Clock Activity Detect Bit 3 = Insert Clock Activity Detect Bit 4 = External Reference Activity Detect Bit 5 = High Stability Reference PLL Activity Bit 6 = Reserved Bit 7 = Low EbNo 0 = Mask, 1 = Allow
<1>	Common Alarm 1 Mask	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Mask, 1 = Allow

<1>	Common Alarm 2 Mask	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Mask, 1 = Allow
<1>	ESC Channel 1 Volume	Binary value, valid in IDR only, +10 dBm to –20 dBm (two's compliment)
<1>	ESC Channel 2 Volume	Binary value, valid in IDR only, +10 dBm to –20 dBm (two's compliment)
<1>	BER Exponent	6 through 9 for Viterbi, 5 through 7 for Sequential
<11>	Rx Circuit ID	11 ASCII characters, null terminated
<1>	Rx Terrestrial Loopback	0 = Disabled, 1 = Enabled
<1>	Rx Baseband Loopback	0 = Disabled, 1 = Enabled
<1>	Rx IF Loopback	0 = Disabled, 1 = Enabled
<1>	Rx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3
<1>	Insert Status Mask	Bit 0 = Frame lock Bit 1 = Multiframe lock. Valid in E1 PCM-30 and PCM-30C Bit 2 = CRC lock. Valid in T1ESF, and E1 CRC enabled Bits 3 – 7 = Reserved 0 = Mask, 1 = Allow
<1>	Rx RS N Code	2 - 255 Reed-Solomon code word length
<1>	Rx RS K Code	1 - 254 Reed-Solomon message length
<1>	Rx RS Depth	4, 8, or 12
<1>	External Clock Source	Reserved
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband
<1>	Alarm 5 Mask	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 – 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Mask, 1 = Allow
<1>	BPSK Symbol Pairing	0 = Normal, 1 = Swapped
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS-232, 1 = RS-485

<1>	ES Baud	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 Bits, 1 = 8 Bits
<1>	IDR Overhead Type	0 = 32K Voice, 1 = 64K Data
<1>	FM Orderwire Mode	Reserved
<1>	TMT Pattern Length	Reserved
<1>	EbNo Threshold	Unsigned Binary Value, 0-99, Implied Decimal Point (0.0 through 9.9 dB)
<2>	Reacquisition Sweep Limit	Binary value, 1 Hz steps, 0 - 65535
<1>	Terrestrial Streaming	0 = Continuous, 1 = Burst
<1>	Terrestrial Framing	0 = DVB 188, 1 = DVB 204, 2 = NONE
<1>	Alarm 6 Mask	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Mask, 1 = Allow
<1>	TPC De-Interleaver	0 = Disabled, 1 = Enabled
<1>	SCC Control Ratio	1 = 1/1, 2 = 1/2, 3 = 1/3, 4 = 1/4, 5 = 1/5, 6 = 1/6, 7 = 1/7
<4>	SCC In band Rate	300 to 200000 bps
<1>	Fast Acquisition	0 = Disabled, 1 = Enabled
<1>	Adjacent Carrier Type	0 = Normal, 1 = High Power
<2>	LBST LNB DC Voltage Alarm Lower Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST LNB DC Voltage Alarm Upper Threshold	Volts, Implied decimal point, 10 = 1.0V (00.0 V to 55.0 V)
<2>	LBST LNB DC Current Alarm Lower Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<2>	LBST LNB DC Current Alarm Upper Threshold	Amps, Implied decimal point, 1000 = 1.000A (0.000 A to 8.000 A)
<1>	Number of Buffer Clock Sources	1 - 5
<1>	First Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Second Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Third Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Forth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Fifth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Asynchronous In-Band Rate	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<2>	Rotation Ambiguity	0 = 0.0.0, 1 = 0.0.1, 2 = 0.1.0, 3 = 0.1.1, 4 = 1.0.0, 5 = 1.0.1, 6 = 1.1.0, 7 = 1.1.1

<2>	RFM AGC Time Constant	1 - 99999 in ms
<1>	Carrier-in-Carrier	0 = Disabled, 1 = Enabled
<2>	Carrier-in-Carrier Minimum Search Delay	0 – 330
<2>	Carrier-in-Carrier Maximum Search Delay	0 – 330
<1>	Carrier-in-Carrier Frequency Offset Range	0 – 30 (KHz)
<1>	EBEM overhead channel rate	0 = Off, 1 = 8K, 2 = 16K, 3 = 24K, 4 = 32K, 5 = 40K, 6 = 48K, 7 = 56K, 8 = 64K
<1>	EBEM embedded channel	0 = Off, 1 = On
<1>	EBEM ITA	0 = Disabled, 1 = Enabled
<1>	EBEM encryption	0 = Disabled, 1 = Enabled
<4>	EBEM Ethernet rate	4800 to 52000000

Opcode: <2A01h> Command a Demodulator's Frequency

Command Data (4 Bytes)		
<4>	Frequency	Selects the IF Frequency in Hz, IF Range = 50 MHz to 180 MHz, L-Band Range = 950 MHz to 2050 MHz

Opcode: <2A02h> Command a Demodulator's Data Rate

Command Data (4 Bytes)		
<4>	Data Rate	Binary value, 1 bps steps 2.4 Kbps to 20 Mbps for DMD20, DMD20LBST and OM20 2.4 Kbps to 52 Mbps for DMD2050, DMD2050E and DMD50

Opcode: <2A03h> Command a Demodulator's Strap Code

Command Data (2 Bytes)		
<2>	Strap Code	Binary value

Opcode: <2A04h> Command a Demodulator's Sweep Boundary

Command Data (1 Byte)		
<1>	Sweep Boundary	Sweep limits. Max of ± 255 kHz in kHz steps 0 – 255

Opcode: <2A05h> Command a Demodulator's Sweep Delay

Command Data (2 Bytes)		
<2>	Sweep Delay	Binary value, 0.1 second steps, Implied decimal point, 0 – 65535 (0.0 sec to 6553.5 sec)

Opcode: <2A07h> Command a Demodulator's Demodulation Type

Command Data (1 Byte)		
<1>	Demodulation Type	0 = QPSK, 1 = BPSK, 2 = 8PSK, 3 = 16QAM, 4 = OQPSK, 5 = RFM, 6 = 8QAM

Opcode: <2A08h> Command a Demodulator's Convolutional Decoder

Command Data (1 Byte)		
<1>	Convolutional Decoder	0 = None, 1 = Viterbi ½, 2 = Viterbi 2/3 (DVB Only), 3 = Viterbi ¾, 4 = Viterbi 5/6 (DVB Only), 5 = Viterbi 7/8, 6 = Reserved, 7 = Sequential ½, 8 = Reserved, 9 = Sequential ¾, 10 = Reserved, 11 = Sequential 7/8, 12 = Reserved, 13 = Reserved, 14 = Trellis 2/3, 15 = Trellis ¾ (DVB - 16QAM Only), 16 = Trellis 5/6 (DVB - 8PSK Only), 17 = Trellis 7/8 (DVB - 16QAM Only), 18 = Trellis 8/9 (DVB - 8PSK Only), 19 = ComStream 3/4 SEQ, 20 = TPC .793 2D, 21 = TPC .495 3D, 22 = Reserved, 23 = TPC ½, 24 = TPC ¾, 25 = TPC 7/8, 26 = TPC 21/44, 27 = TPC .750, 28 = TPC .875, 29 = TPC .288, 30 = TPC 7/8 Short, 31 = TPC 3/4 Short, 32 = TPC 5/16, 33 = Flex 1/2, 34 = Flex 2/3, 35 = Flex 3/4, 36 = Flex 7/8, 37 = Flex 19/20, 61 = LDPC 1/2, 62 = LDPC 2/3, 63 = LDPC 3/4, 64 = LDPC 4/5, 65 = LDPC 5/6, 68 = LDPC 8/9, 69 = LDPC 9/10, 73 = LDPC 3/5

Opcode: <2A09h> Command a Demodulator's Differential Decoder

Command Data (1 Byte)		
<1>	Differential Decoder	0 = Disabled, 1 = Enabled

Opcode: <2A0Ah> Command a Demodulator's Reed-Solomon

Command Data (1 Byte)		
<1>	Reed Solomon	0 = Disabled, 1 = Enabled

Opcode: <2A0Bh> Command a Demodulator's Network Specification

Command Data (1 Byte)		
<1>	Network Spec	0 = Closed Net, 1 = IDR, 2 = IBS, 3 = D & I, 5 = DVB SAT, 11 = MIL-188-165A, 16 = RFM, 17 = Ebem

Opcode: <2A0Ch> Command a Demodulator's Filter Mask

Command Data (1 Byte)		
<1>	Spectral Mask	0 = INTELSAT 0.35, 18 = MIL-188-165A, 20 = DVB 0.20, 25 = DVB 0.25, 35 = DVB 0.35

Opcode: <2A0Dh> Command a Demodulator's Descrambler Control

Command Data (1 Byte)		
<1>	Descrambler Control	0 = Disabled, 1 = Enabled

Opcode: <2A0Eh> Command a Demodulator's Descrambler Type

Command Data (1 Byte)		
<1>	Descrambler Type	0 = None, 1 = IBS, 2 = V35 IESS, 3 = V35 CCITT, 4 = V35 EFDATA, 5 = V35 FAIRCHILD, 6 = OM-73, 7 = RS, 8 = RS EFDATA, 9 = TPC, 10 = DVB, 11 = EDMAC, 12 = TPC and IBS, 13 = TPC and EDMAC, 14 = V35 ComStream, 15 = R11, 16 = Ebem Sync

Opcode: <2A0Fh> Command a Demodulator's Spectrum

Command Data (1 Byte)		
<1>	Spectrum	0 = Normal, 1 = Inverted

Opcode: <2A10h> Command a Demodulator's Buffer Size

Command Data (1 Byte)		
<1>	Buffer Size msec	Indicates buffer size in msecs, 0 through 64

Opcode: <2A11h> Command a Demodulator's Buffer Clock

Command Data (7 Bytes)		
<1>	Active Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI
<1>	Number of Buffer Clock Sources	1 – 5
<1>	First Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Second Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Third Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Forth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique
<1>	Fifth Buffer Clock Source	0 = SCTE, 1 = SCT, 2 = EXT BNC, 3 = RX SAT, 4 = EXT IDI, Each buffer clock source must be unique

Opcode: <2A12h> Command a Demodulator's Buffer Clock Polarity

Command Data (1 Byte)		
<1>	Buffer Clock Polarity	0 = Normal, 1 = Inverted

Opcode: <2A13h> Command a Demodulator's Insert Mode

Command Data (1 Byte)		
<1>	Insert Mode	0 = Disabled, 1 = T1-D4, 2 = T1-ESF, 3 = PCM-30, 4 = PCM-30C, 5 = PCM-31, 6 = PCM-31C, 7 = SLC-96, 8 = T1 D4 S, 9 = T1 ESF S

Opcode: <2A15h> Command a Demodulator's T1E1 Frame Source

Command Data (1 Byte)		
<1>	T1E1 Frame Source	0 = Internal, 1 = External, 2 = IDI/DDO Loopback

Opcode: <2A16h> Command a Demodulator's Satellite Framing

Command Data (1 Byte)		
<1>	Satellite Framing	0 = No Framing, 1 = 96K IDR, 2 = 1/15 IBS, 3 = EF AUPC 1/15, 4 = DVB, 5 = EDMAC, 6 = SCC, 7 = 96K, 8 = Efficient D&I, 9 = Ebem

Opcode: <2A17h> Command a Demodulator's Test Pattern

Command Data (1 Byte)		
<1>	RX Test Pattern	0 = None, 1 = 2047 (2^11-1), 2 = 2^15-1, 3 = 2^23-1

Opcode: <2A18h> Command Map Summary to Backward Alarm

Command Data (1 Byte)		
<1>	Map Summary To Backward Alarm	0 = None, 1 = BK1, 2 = BK2, 3 = BK1 & 2, 4 = BK3, 5 = BK1 & 3, 6 = BK2 & 3, 7 = BK1, 2 & 3, 8 = BK4, 9 = BK1 & 4, 10 = BK2 & 4, 11 = BK1, 2 & 4, 12 = BK3 & 4, 13 = BK1, 3 & 4, 14 = BK2, 3 & 4, 15 = BK1, 2, 3 & 4

Opcode: <2A1Ah> Command a Demodulator's BER Exponent

Command Data (1 Byte)		
<1>	BER Exponent	6 – 9 for Viterbi, 5 – 7 for Sequential

Opcode: <2A1Bh> Command a Demodulator's Circuit ID

Command Data (11 Bytes)		
<11>	Rx Circuit ID	11 ASCII characters, null terminated

Opcode: <2A1Ch> Command a Demodulator's Terrestrial Loopback

Command Data (1 Byte)		
<1>	Rx Terrestrial Loopback	0 = Disabled, 1 = Enabled

Opcode: <2A1Dh> Command a Demodulator's Baseband Loopback

Command Data (1 Byte)		
<1>	Rx Baseband Loopback	0 = Disabled, 1 = Enabled

Opcode: <2A1Eh> Command a Demodulator's IF Loopback

Command Data (1 Byte)		
<1>	Rx IF Loopback	0 = Disabled, 1 = Enabled

Opcode: <2A1Fh> Command a Demodulator's Interface Type

Command Data (1 Byte)

<1>	Rx Interface Type	0 = G.703 Bal T1 AMI, 1 = G.703 Bal T1 B8ZS, 2 = G.703 B E1 HDB3, 3 = G.703 Bal T2 B6ZS, 4 = G.703 Unbal E1 HDB3, 5 = G.703 Unbal T2 B8ZS, 6 = G.703 Unbal E2 HDB3, 7 = RS422 Serial, 8 = V.35, 9 = RS232 Serial, 10 = HSSI, 11 = ASI, 12 = Advanced ASI, 13 = M2P Parallel, 14 = DVB Parallel, 24 = Ethernet Bridge, 25 = MIL-188-114A, 26 = RS423 Serial, 27 = Eurocomm 256, 28= Eurocomm 512, 29 = Eurocomm 1024, 30 = Eurocomm 2048, 31 = G.703 Unbal T3 B3ZS, 32 = G.703 Unbal E3 HDB3, 33 = G.703 Unbal STS1 HDB3

Opcode: <2A20h> Command Center Buffer (No Parameters)

Command Data (0 Bytes)

Opcode: <2A21h> Command a Demodulator's Data Invert

Command Data (1 Byte)		
<1>	Data Invert	0 = None, 1 = Terrestrial, 2 = Baseband, 3 = Terrestrial and Baseband

Opcode: <2A22h> Command Force Demodulator Alarm Test

Command Data (1 Byte)		
<1>	Force Alarm Test	Bit 0 = Rx Major Alarm Bits 1 – 7 = Spares 0 = Do not force, 1 = Force

Opcode: <2A23h> Command External EXC Source

Command Data (1 Byte)		
<1>	External EXC Source	Reserved

Opcode: <2A24h> Clear Demodulator Latched Alarm 1 (No Data)

Command Data (0 Bytes)

Opcode: <2A25h> Clear Demodulator Latched Alarm 2 (No Data)

Command Data (0 Bytes)

Opcode: <2A26h> Clear Demodulator Latched Alarm 3 (No Data)

Command Data (0 Bytes)

Opcode: <2A2Fh> Command Demodulator Reacquisition Boundary

Command Data (2 Bytes)		
<2>	Reacquisition Sweep Limit	Binary value, 1 Hz steps, 0 – 65535

Opcode: <2A32h> Command a demodulator's Reed Solomon N & K Codes and Interleaver Depth

Command Data (3 Bytes)		
<1>	Rx RS N Code	2 – 255 Reed-Solomon code word length
<1>	Rx RS K Code	1 – 254 Reed-Solomon message length
<1>	Rx RS Depth	4, 8 or 12 Reed Solomon Interleaver Depth

Opcode: <2A34h> Command Demodulator TPC Interleaver

Command Data (1 Byte)		
<1>	TPC Interleaver	0 = Disabled, 1 = Enabled

Opcode: <2A35h> Command Demodulator Async Configuration

Command Data (4 Bytes)		
<1>	ES Mode	0 = Normal, 1 = Enhanced
<1>	ES Type	0 = RS-232, 1 = RS-485
<1>	ES Baud	0 =150, 1 = 300, 2 = 600, 3 = 1200, 4 = 2400, 5= 4800, 6 = 9600, 7 = 19200, 8 = 38400, 9 = 57600, 10 = 115200
<1>	ES Data Bits	0 = 7 Bits, 1 = 8 Bits

Opcode: <2A36h> Command a Demodulator's Fast Acquisition

Command Data (1 Byte)		
<1>	Fast Acquisition	0 = Disabled, 1 = Enabled

Opcode: <2A37h> Command Clear Demodulator Ethernet Terrestrial Interface Packet Status (No Parameters)

Command Data (0 Bytes)

Opcode: <2A38h> Command a Demodulator's RFM AGC Time Constant

Command Data (2 Bytes)		
<2>	RFM AGC Time Constant	1 - 99999 in ms

Opcode: <2A39h> Command a Demodulator's CNC Setup

Command Data (6 Bytes)		
<1>	Carrier-in-Carrier	0 = Disabled, 1 = Enabled
<2>	Carrier-in-Carrier Minimum Search Delay	0 – 330
<2>	Carrier-in-Carrier Maximum Search Delay	0 – 330
<1>	Carrier-in-Carrier Frequency Offset Range	0 – 30 (KHz)

1.5.3 Modem Queries & Commands:

Opcode: <2403h> Query a Modem's Identification

Query Response (1 Byte)		
<1>	Modem ID	DMD20 Modulator = 20, DMD20 Demodulator = 21, DMD20 Modem = 22

Opcode: <2404h> Query a Modem's Control Mode

Query Response (1 Byte)		
<1>	Modem control mode	0 = Front Panel, 1 = Terminal, 2 = Computer Note: DMD20 will always return 2 = Computer

Opcode: <2407h> Query a Modem's Latched Alarms

Query Response (11 Bytes)		
<1>	Mod Latched Alarm 1	Bit 0 = Transmit FPGA/Processor Fault Bit 1 = Drop DSP Bit 2 = Transmit Symbol Clock PLL Lock Bit 3 = Reserved Bit 4 = Transmit L-Band Synthesizer Lock Bits 5 – 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Demod Latched Alarm 1	Bit 0 = Receive FPGA/Processor Fault Bit 1 = Carrier Loss Bit 2 = Multiframe Sync Loss Bit 3 = Frame Sync Loss Bit 4 = IBS BER Alarm Bit 5 = Satellite AIS Bit 6 = Rx Data Activity Bit 7 = Rx AGC Level 0 = Not Latched, 1 = Latched
<1>	Demod Latched Alarm 2	Bit 0 = Buffer Underflow Bit 1 = Buffer Overflow Bit 2 = Buffer Under 10% Bit 3 = Buffer Over 90% Bit 4 = RS Decoder Lock Fault Bit 5 = RS De-Interleaver Fault Bit 6 = RS Decoder Uncorrectable Word Bit 7 = Reserved 0 = Not Latched, 1 = Latched
<1>	Demod Latched Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock Bit 1 = Insert DSP Config Bit 2 = Buffer Clock PLL Lock Detect Bit 3 = Viterbi Decoder Lock Bit 4 = Sequential Decoder Lock Bit 5 = Rx Test Pattern Lock Bit 6 = External Reference PLL Lock Bit 7 = Rx Carrier Level 0 = Not Latched, 1 = Latched

<1>	Latched Common Alarm 1	Bit 0 = -12V Alarm Bit 1 = +12V Alarm Bit 2 = +5V Alarm Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Latched Common Alarm 2	Bit 0 = TERR FPGA Config Bit 1 = CODEC FPGA Config Bit 2 = CODEC Device Config Bit 3 = TRANSEC Power Test Bit 4 = +1.5 V Rx Alarm Bit 5 = +1.5 V TX Alarm Bit 6 = +3.3 V Alarm Bit 7 = +20 V Alarm 0 = Not Latched, 1 = Latched
<1>	Mod Latched Alarm 2	Bit 0 = Terrestrial Clock Activity Detect Bit 1 = Internal Clock Activity Detect Bit 2 = Tx Sat Clock Activity Detect Bit 3 = Tx Data Activity Detect Bit 4 = Terrestrial AIS. Tx Data AIS Detect Bit 5 = Tx Clock Fallback Bit 6 = DVB Frame Lock Fault Bit 7 = TPC Conflict Check 0 = Not Latched, 1 = Latched
<1>	Mod Latched Alarm 4	Bit 0 = LBST BUC DC Current Alarm Bit 1 = LBST BUC DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bit 3 = LBST BUC PLL Alarm Bit 4 = LBST BUC Over Temperature Alarm Bit 5 = LBST BUC Summary Alarm Bit 6 = LBST BUC Output Enable Alarm Bit 7 = LBST BUC Communications Alarm 0 = Not Latched, 1 = Latched
<1>	Demod Latched Alarm 4	Bits 0 – 6 = Reserved Bit 7 = Low EbNo 0 = Not Latched, 1 = Latched
<1>	Demod Latched Alarm 5	Bit 0 = Trellis Decoder Lock Bit 1 = IFEC Alarm Bit 2 = T1/E1 Signaling Bit 3 = TPC Conflict Check Bit 4 & 5 = Spares Bit 6 = DVB Frame Lock Fault Bit 7 = Spare 0 = Not Latched, 1 = Latched
<1>	Demod Latched Alarm 6	Bit 0 = LBST LNB DC Current Alarm Bit 1 = LBST LNB DC Voltage Alarm Bit 2 = Ethernet WAN Alarm Bits 3 – 7 = Spares 0 = Not Latched, 1 = Latched

Opcode: <240Ah> Query a Modem's Current Alarms

Query Response (14 Bytes)

<1>	Mod Alarm 1	Bit 0 = Transmit FPGA/Processor Fault, 1 = Fail Bit 1 = Drop DSP, 1 = Fail Bit 2 = Transmit Symbol Clock PLL Lock, 1 = Lock Bit 3 = Reserved Bit 4 = IF/L-Band Synthesizer Lock, 1 = Lock Bits 5 & 6 = Reserved Bit 7 = Mod Summary Fault, 1 = Fail
<1>	Mod Alarm 2	Bit 0 = Terrestrial Clock Activity Detect, 1 = Activity Bit 1 = Internal Clock Activity Detect, 1 = Activity Bit 2 = Tx Sat Clock Activity Detect, 1 = Activity Bit 3 = Tx Data Activity Detect, 1 = Activity Bit 4 = Terrestrial AIS. Tx Data AIS Detect, 1 = AIS Fail Bit 5 = Tx Clock Fallback, 1 = Clock Fallback Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = TPC Conflict Check, 1 = Fail
<1>	Drop Status Fault	Bit 0 = Frame lock fault, 1 = Fail Bit 1 = Multiframe lock Fault. Valid in E1 PCM-30 and PCM-30C, 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled, 1 = Fail Bits 3 – 7 = Reserved
<1>	Demod Alarm 1	Bit 0 = Receive FPGA/Processor Fault, 1 = Fail Bit 1 = Carrier Loss, 1 = Fail Bit 2 = Multiframe Sync Loss, 1 = Fail Bit 3 = Frame Sync Loss, 1 = Fail Bit 4 = IBS BER Alarm, 1 = Fail Bit 5 = Satellite AIS, 1 = Fail Bit 6 = Rx Data Activity, 1 = Activity Bit 7 = Rx AGC Level, 1 = Fail
<1>	Demod Alarm 2	Bit 0 = Buffer Underflow, 1 = Underflow Bit 1 = Buffer Overflow, 1 = Overflow Bit 2 = Buffer Under 10%, 1 = Fail Bit 3 = Buffer Over 90%, 1 = Fail Bit 4 = RS Decoder Lock Fault, 1 = Fail Bit 5 = RS De-Interleaver Fault, 1 = Fail Bit 6 = RS Decoder Uncorrectable Word, 1 = Fail Bit 7 = Demod Summary Fault, 1 = Fail
<1>	Demod Alarm 3	Bit 0 = Rx L-Band Synthesizer Lock, 1 = Lock Bit 1 = Insert DSP Config, 1 = Fail Bit 2 = Buffer Clock PLL Lock Detect, 1 = Lock Bit 3 = Viterbi Decoder Lock, 1 = Lock Bit 4 = Sequential Decoder Lock, 1 = Lock Bit 5 = Rx Test Pattern Lock, 1 = Lock Bit 6 = External Reference PLL Lock, 1 = Lock Bit 7 = Rx Carrier Level, 1 = Fail
<1>	Demod Alarm 4	Bit 0 = Buffer Clock Activity Detect, 1 = Activity Bit 1 = External BNC Activity Detect, 1 = Activity Bit 2 = Rx Satellite Clock Activity Detect, 1 = Activity Bit 3 = Insert Clock Activity Detect, 1 = Activity Bit 4 = External Reference Activity Detect, 1 = Activity Bit 5 = High Stability Reference PLL Activity, 1 = Activity Bit 6 = Reserved Bit 7 = Low EbNo, 1 = Fail

<1>	Insert Status Fault	Bit 0 = Frame lock fault. 1 = Fail Bit 1 = Multiframe lock fault. Valid in E1 PCM-30 and PCM-30C, 1 = Fail Bit 2 = CRC lock fault. Valid in T1ESF, and E1 CRC enabled. 1 = Fail Bits 3 – 7 = Reserved
<1>	Common Alarm 1	Bit 0 = -12V Alarm, 1 = Fail Bit 1 = +12V Alarm, 1 = Fail Bit 2 = +5V Alarm, 1 = Fail Bits 3 – 5 = Reserved Bit 6 = IF SYNTH Alarm, 1 = Fail Bit 7 = Spare
<1>	Common Alarm 2	Bit 0 = TERR FPGA Config, 1 = Fail Bit 1 = CODEC FPGA Config, 1 = Fail Bit 2 = CODEC Device Config, 1 = Fail Bit 3 = TRANSEC Power Test, 1 = Fail Bit 4 = +1.5 V Rx Alarm, 1 = Fail Bit 5 = +1.5 V TX Alarm, 1 = Fail Bit 6 = +3.3 V Alarm, 1 = Fail Bit 7 = +20 V Alarm, 1 = Fail
<1>	Mod Backward Alarms	Bit 0 = Backward Alarm 1 Transmitted Bit 1 = Backward Alarm 2 Transmitted Bit 2 = Backward Alarm 3 Transmitted Bit 3 = Backward Alarm 4 Transmitted Bits 4 & 5 = Spares Bit 6 = IBS Prompt Alarm Transmitted Bit 7 = IBS Service Alarm Transmitted 0 = No, 1 = Yes
<1>	Mod Alarm 4	Bit 0 = LBST BUC DC Current Alarm, 1 = Fail Bit 1 = LBST BUC DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bit 3 = LBST BUC PLL Alarm, 1 = Fail Bit 4 = LBST BUC Over Temperature Alarm, 1 = Fail Bit 5 = LBST BUC Summary Alarm, 1 = Fail Bit 6 = LBST BUC Output Enable Alarm, 1 = Fail Bit 7 = LBST BUC Communications Alarm, 1 = Fail
<1>	Demod Alarm 5	Bit 0 = Trellis Decoder Lock, 1 = Lock Bit 1 = IFEC Alarm, 1 = fail Bit 2 = T1/E1 Signaling, 1 = Fail Bit 3 = TPC Conflict Check, 1 = Fail Bit 4 & 5 = Spares Bit 6 = DVB Frame Lock Fault, 1 = Fail Bit 7 = Spare
<1>	Demod Alarm 6	Bit 0 = LBST LNB DC Current Alarm, 1 = Fail Bit 1 = LBST LNB DC Voltage Alarm, 1 = Fail Bit 2 = Ethernet WAN Alarm, 1 = Fail Bits 3 – 7 = Spares

Opcode: <240Dh> Query a Modem's Eb/No, BER, and Level

Query Response (11 Bytes)		
<2>	Raw BER Mantissa	Bytes 1 - 2 = Binary value Raw BER
<2>	Corrected BER Mantissa	Bytes 1 - 2 = Binary value corrected BER
<2>	EbNo	Binary value, 1 decimal point implied

<1>	Raw BER Exponent	Byte 3 = Binary value exponent
<1>	Corrected BER Exponent	Byte 3 = Binary value exponent
<1>	BER/EbNo Status	Bit 0 = Raw BER and corrected BER status. 1 = Valid Bit 1 = Test BER status. 1 = Valid Bits 2 – 3 = EbNo status, 0 = EbNo is invalid, 1 = EbNo is valid, 2 = EbNo is smaller than indicated value, 3 = EbNo is greater than indicated value Bit 4 = BER Counter Overflow. 1 = Overflow Condition Bit 5 = Test BER Counter Overflow, 1 = Overflow Condition Bits 6 – 7 = Reserved
<1>	Input Level	Binary value in 1 dB steps
<1>	Reacquisition Is Ready	0 = Uses full Sweep Range to acquire signal lock, 1 = Uses Reacquisition range to acquire signal lock

Opcode: <240Eh> Query Time

Query Response (3 Bytes)		
<1>	Hour	0 – 23
<1>	Minute	0 – 59
<1>	Second	0 – 59

Opcode: <240Fh> Query Date

Query Response (3 Bytes)		
<1>	Year	0 – 99
<1>	Month	0 – 11
<1>	Day	0 – 30

Opcode: <2410h> Query Time and Date

Query Response (6 Bytes)		
<1>	Year	0 – 99
<1>	Month	0 – 11
<1>	Day	0 – 30
<1>	Hour	0 – 23
<1>	Minute	0 – 59
<1>	Second	0 – 59

Opcode: <2411h> Query Modem Summary Faults

Query Response (2 Bytes)		
<1>	Mod Summary Fault	0 = Pass, 1 = Fail
<1>	Demod Summary Fault	0 = Pass, 1 = Fail

Opcode: <2412h> Query a Modem's Event Buffer

Command Data (2 Bytes)		
<1>	Starting Point	(0..99) Stored event number to start query at 1 through 100

<1>	Number Of Events	Number of events to query, maximum events that can be queried is 3
Query Response (1, 77, 153 or 229 Bytes)		
<1>	Number Of Events	Number of events in response: 0 = no events, there is no additional response data, 1 = 1 event, see event data for additional response data, 2 = 2 events, see event data for additional response data, event data will repeat once, 3 = 3 events, see event data for additional response data, event data will repeat twice
Event Data (76 Bytes Per Event)		
<4>	Event Number	Actual event number since events were cleared NOTE Events are cleared on a power cycle, via the front panel when the “CLEAR” key is pressed using “ERASE EVENTS” under the “MONITOR” menu or via the remote port by using opcode 2C0Ah and selecting 2 delete all events The event number listed here is the actual event number since events were cleared. The event buffer stores up to 100 events; once the 101st event occurs the first event stored in the event buffer is event number 2 and the last is event number is 101. As new events occur they are appended to the end of the event buffer and events at the beginning of the buffer are dropped.
<2>	Reserved	Ignored
<1>	Hour	0 – 23
<1>	Minute	0 – 59
<1>	Second	0 – 59
<1>	Reserved	Ignored
<1>	Year	0 – 99
<1>	Month	0 – 11
<1>	Day	0 – 30
<3>	Reserved	Ignored
<58>	Event	ASCII character string, null terminated
<2>	Reserved	Ignored

Opcode: <2402h> Query a Modem's Drop & Insert Map

Command Data (1 Byte)		
<1>	Requested map	0 = Drop active map, 1 = Insert active map, 2 = Drop edit map, 3 = Insert edit map, 4 - 11 = User map #1 through #8, 12 - 19 = ROM maps #1 - #8
Query Response (31 Bytes)		
<1>	Requested map number	0 = Drop active map, 1 = Insert active map, 2 = Drop edit map, 3 = Insert edit map, 4 - 11 = User map #1 through #8, 12 - 19 = ROM maps #1 - #8
<30>	Requested map	(Mapping of Satellite channels 1 thru 30 to dropped or inserted Terrestrial Timeslots (Terrestrial Timeslots = 1..31) (0 = Insert None))

Opcode: <2C00h> Command Drop & Insert Map Copy

Command Data (2 Bytes)		
<1>	From Map	0 = Drop active map, 1 = Insert active map, 2 = Drop edit map, 3 = Insert edit map, 4 - 11 = User map #1 through #8, 12 - 19 = ROM maps #1..#8
<1>	To map	0 = Drop active map, 1 = Insert active map, 2 = Drop edit map, 3 = Insert edit map, 4 – 11 = User map #1 through #8

Opcode: <2C01h> Command Drop & Insert Map

Command Data (31 Bytes)		
<1>	Map to Change	0 = Drop active map, 1 = Insert active map, 2 = Drop edit map, 3 = Insert edit map, 4 – 11 = User map #1 through #8
<30>	New map	(Mapping of Satellite channels 1 thru 30 to dropped or inserted Terrestrial Timeslots (Terrestrial Timeslots = 1..31) (0 = Insert None))

Opcode: <2C03h> Command Clear Latched Alarms (No Parameters)

Command Data (0 Bytes)

Opcode: <2C04h> Command Set Time

Command Data (3 Bytes)		
<1>	Hour	0 – 23
<1>	Minute	0 – 59
<1>	Second	0 – 59

Opcode: <2C05h> Command Set Date

Command Data (3 Bytes)		
<1>	Year	0 – 99
<1>	Month	0 – 11
<1>	Day	0 – 30

Opcode: <2C06h> Command Set Time and Date

Command Data (6 Bytes)		
<1>	Year	0 – 99
<1>	Month	0 – 11
<1>	Day	0 – 30
<1>	Hour	0 – 23
<1>	Minute	0 – 59
<1>	Second	0 – 59

Opcode: <2C08h> Clear Modem Common Latched Alarm 1 (No Data)

Command Data (0 Bytes)

Opcode: <2C09h> Clear Modem Common Latched Alarm 2 (No Data)

Command Data (0 Bytes)

Opcode: <2C0Ah> Command Delete a Modem's Event Buffer

Command Data (1 Byte)		
<1>	Events to Delete	1 = delete one event (deletes first event in buffer) , 2 = delete all events

Opcode: <2C0Bh> Command Soft Reset (No Data) (Stops petting the watch dog to restart the processor)

Command Data (0 Bytes)

Opcode: <2490h> Query Up Converter Configuration

Query Response (22 Bytes)		
<8>	LO Frequency	Hz
<1>	Mix Select	0 = High side, 1 = Low side
<1>	Reference Enable	0 = Disabled, 1 = Enabled
<1>	Supply Voltage Enable	0 = Disabled, 1 = Enabled
<1>	FSK Communications Select	0 = None, 1 = Codan, 2 = TerraSat, 3 = Amplus
<2>	BUC Address	
<1>	BUC Output Enable	0 = Disabled, 1 = Enabled
<2>	BUC Carrier Level	Implied decimal point, dBm
<4>	BUC Summary Status	
<1>	BUC Temperature	Degrees, C

Opcode: <2491h> Query Uplink RF

Query Response (8 Bytes)		
<8>	RF	Hz

Opcode: <2492h> Query Down Converter Configuration

Query Response (12 Bytes)		
<8>	LO Frequency	Hz
<1>	Mix Select	0 = High side, 1 = Low side
<1>	Reference Enable	0 = Disabled, 1 = Enabled
<1>	Supply Voltage Enable	0 = Disabled, 1 = Enabled
<1>	Supply Voltage Select	13, 16, 18, 24, 48

Opcode: <2493h> Query Downlink RF

Query Response (8 Bytes)		
<8>	RF	Hz

Opcode: <2500h> Command Up Converter Configuration

Command Data (15 Bytes)		
<8>	LO Frequency	Hz
<1>	Mix Select	0 = High side, 1 = Low side
<1>	Reference Enable	0 = Disabled, 1 = Enabled
<1>	Supply Voltage Enable	0 = Disabled, 1 = Enabled
<1>	FSK Communications Select	0 = None, 1 = Codan, 2 = TerraSat, 3 = Amplus
<2>	BUC Address	
<1>	BUC Output Enable	0 = Disabled, 1 = Enabled

Opcode: <2501h> Command Uplink RF

Command Data (8 Bytes)		
<8>	RF	Hz

Opcode: <2502h> Command Down Converter Configuration

Command Data (12 Bytes)		
<8>	LO Frequency	Hz
<1>	Mix Select	0 = High side, 1 = Low side
<1>	Reference Enable	0 = Disabled, 1 = Enabled
<1>	Supply Voltage Enable	0 = Disabled, 1 = Enabled
<1>	Supply Voltage Select	13, 16, 18, 24, 48

Opcode: <2503h> Command Downlink RF

Command Data (8 Bytes)		
<8>	RF	Hz

Opcode: <2F61h> Command BUC FSK Pass Thru

Command Data (64 Bytes)		
<64>	BUC FSK Command Data	Null Terminated ASCII string

Opcode: <2E06h> Query BUC FSK Pass thru Reply

Query Response (255 Bytes)		
<255>	BUC FSK Reply Data	Null Terminated ASCII string

NOTE

The following opcode is for customer purchased and installed features only.

Opcode: <2450h> Query a Module's Installed Features (Customer Purchased)

Query Response (6 Bytes)		
<1>	Installed Features 1	Bit 0 = 1 Mbps data rate Bit 1 = 5 Mbps data rate Bit 2 = 10 Mbps data rate Bit 3 = 20 Mbps data rate Bit 4 = Rx IF Band Bit 5 = Rx L Band Bit 6 = Tx IF Band Bit 7 = Tx L Band 0 = Feature Not Installed, 1 = Feature Installed
<1>	Installed Features 2	Bit 0 = Enhanced ASYNC Feature Bit 1 = IDR Feature Bit 2 = Sequential Feature Bit 3 = Reed Solomon Bit 4 = Custom Reed Solomon Feature Bit 5 = IBS Feature Bit 6 = Drop & Insert Feature Bit 7 = AUPC Feature 0 = Feature Not Installed, 1 = Feature Installed
<1>	Installed Features 3	Bit 0 = 8PSK Feature Bit 1 = 16QAM Feature Bit 2 = 5 Mbps Turbo Codec Feature Bit 3 = 20 Mbps Turbo Codec Feature Bit 4 = OM73 Feature Bit 5 = DVB Feature Bit 6 = EDMAC Feature Bit 7 = 512 Kbps Data Rate 0 = Feature Not Installed, 1 = Feature Installed
<1>	Installed Features 4	Bit 0 = 52 Mbps data rate (DMD1050, DMD2050, DMD2050E and DMD 50 only) Bit 1 = 52 MHz Turbo Codec Feature (DMD2050, DMD2050E and DMD 50 only) Bit 2 = FSK (DMD20LBST and OM20 only) Bit 3 = 16APSK Feature (DMD2050E Only) Bit 4 = TPC 7/8 short KHz Feature (Super Card Only) Bit 5 = R11 Scrambler Feature Bit 6 = Eth Wan Monitor Feature Bit 7 = Spare 0 = Feature Not Installed, 1 = Feature Installed
<1>	Installed Features 5	Bit 0 = 8QAM Feature Bit 1 = LDPC 5 Mbps Feature Bit 2 = LDPC 10 Mbps Feature Bit 3 = LDPC 20 Mbps Feature Bit 4 = CNC 512 Kbps Feature Bit 5 = CNC 1 Mbps Feature Bit 6 = CNC 2.5 Mbps Feature Bit 7 = CNC 5 Mbps Feature 0 = Feature Not Installed, 1 = Feature Installed

<1>	Installed Features 6	Bit 0 = CNC 10 Mbps Feature Bit 1 = CNC 15 Mbps Feature Bit 2 = CNC 20 Mbps Feature Bit 3 = CNC 25 Mbps Feature Bit 4 = CNC 30 Mbps Feature Bit 5 = CNC 40 Mbps Feature Bit 6 = CNC 52 Mbps Feature Bit 7 = EBEM 0 = Feature Not Installed, 1 = Feature Installed

The features that are set refer to options purchased by the customer. These could be a subset of the overall physical capabilities of the product.

The highest data rate feature that is set indicates the highest data rate the product can attain. This is also true for the Turbo Codec rates.

Notes:

Chapter 2. SNMP (MIB)

```
DMD20-MIB DEFINITIONS ::= BEGIN

IMPORTS
  enterprises
    FROM SNMPv2-SMI
  MODULE-IDENTITY, OBJECT-TYPE, Unsigned32, NOTIFICATION-TYPE, Counter32,
Counter64
    FROM SNMPv2-SMI
  TEXTUAL-CONVENTION
    FROM SNMPv2-TC
  OBJECT-GROUP, NOTIFICATION-GROUP
    FROM SNMPv2-CONF;

  radyne              OBJECT IDENTIFIER ::= { enterprises 2591 }

dmd20 MODULE-IDENTITY
  LAST-UPDATED "200903111600Z"
  ORGANIZATION "Comtech EF Data Corp"
  CONTACT-INFO
       "Customer Service
       Postal: Comtech EF Data Corporation
       2114 West 7th Street
       Tempe, AZ 85281
       USA
       Tel: (480) 333-2200
       Fax: (480) 333-2540
       Website: www.comtechefdata.com"

  DESCRIPTION
       "Comtech EF Data MIB module."

  REVISION     "200812041600Z"
  DESCRIPTION   "DMD20 MIB
            Object Identifiers description. This documents contents
            are subject to change without prior notice. The private enterprise
            number 2591 is a unique identifier assigned to Comtech EF Data
            by the Internet Assigned Numbers Authority (IANA).
            This number is used to uniquely define vendor specific
            information such as private MIBs."

  ::= { radyne 15 }

-- groups in Comtech EF Data specific MIB
```

```
-- radyne                  OBJECT IDENTIFIER ::= { enterprises 2591 }

  dmd20MibObjects          OBJECT IDENTIFIER ::= { dmd20 1 }

  radDmd20ModNVStatus      OBJECT IDENTIFIER ::= { dmd20MibObjects 1 }
  radDmd20ModStatus        OBJECT IDENTIFIER ::= { dmd20MibObjects 2 }

  radDmd20DemodNVStatus    OBJECT IDENTIFIER ::= { dmd20MibObjects 3 }
  radDmd20DemodStatus      OBJECT IDENTIFIER ::= { dmd20MibObjects 4 }

  radDmd20CommonNVStatus   OBJECT IDENTIFIER ::= { dmd20MibObjects 5 }
  radDmd20CommonStatus     OBJECT IDENTIFIER ::= { dmd20MibObjects 6 }

  radDmd20Traps            OBJECT IDENTIFIER ::= { dmd20MibObjects 7 }

  radDmd20Lbst             OBJECT IDENTIFIER ::= { dmd20MibObjects 8 }
  radDmd20ModLbstNVStatus  OBJECT IDENTIFIER ::= { radDmd20Lbst 1 }
  radDmd20ModLbstStatus    OBJECT IDENTIFIER ::= { radDmd20Lbst 2 }
  radDmd20DemodLbstNVStatus OBJECT IDENTIFIER ::= { radDmd20Lbst 3 }
  radDmd20DemodLbstStatus  OBJECT IDENTIFIER ::= { radDmd20Lbst 4 }

  radDmd20MibConformance   OBJECT IDENTIFIER ::= { dmd20 2 }
  radDmd20Groups           OBJECT IDENTIFIER ::= { radDmd20MibConformance 1 }
  radDmd20AgentCapabilities OBJECT IDENTIFIER ::= { radDmd20MibConformance 2 }

-- ------------------------------------------------------------------------------------------
-- ------------------------------------------------------------------------------------------
-- Textual Conventions

RadTransmitCompensation ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "d-1"
  STATUS        current
  DESCRIPTION   "Power level in tenths of a dBm."
  SYNTAX        INTEGER (0..10)

RadTransmitPowerLevel ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "d-1"
  STATUS        current
  DESCRIPTION   "Power level in tenths of a dBm.”
  SYNTAX        INTEGER (-250..0)

RadAupcTransmitPowerLevel ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "d-2"
  STATUS        current
  DESCRIPTION   "Power level in hundreds of a dBm.
  SYNTAX        INTEGER (-2500..0)

RadReceivePowerLevel ::= TEXTUAL-CONVENTION
  STATUS        current
  DESCRIPTION   "Receive power level in dBm."
  SYNTAX        INTEGER (-100..0)

RadESCGain ::= TEXTUAL-CONVENTION
  STATUS        current
  DESCRIPTION   "Sets the ESC channel volume in dB."
  SYNTAX        INTEGER (-20..10)
```

```
RadVoltageLevel ::= TEXTUAL-CONVENTION
  DISPLAY-HINT   "d-1"
  STATUS         current
  DESCRIPTION    "Voltage level in tenths of a volt."
  SYNTAX         INTEGER (0..550)

RadCurrentLevel ::= TEXTUAL-CONVENTION
  DISPLAY-HINT   "d-3"
  STATUS         current
  DESCRIPTION    "Current level in milliamps."
  SYNTAX         INTEGER (0..8000)

ControlType ::= TEXTUAL-CONVENTION
  STATUS         current
  DESCRIPTION    "Represents a boolean control value."
  SYNTAX         INTEGER { disable(1), enable(2) }

OffOnType ::= TEXTUAL-CONVENTION
  STATUS         current
  DESCRIPTION    "Represents a boolean Off/ON control value."
  SYNTAX         INTEGER { off(1), on(2) }

InversionType ::= TEXTUAL-CONVENTION
  STATUS         current
  DESCRIPTION    "Represents a boolean inversion value."
  SYNTAX         INTEGER { normal(1), inverted(2) }

BerStatusStringType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "8a"
  STATUS        current
  DESCRIPTION   "Raw BER status"
  SYNTAX        OCTET STRING (SIZE (10))

CarrierSweepDelayType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "d-1"
  STATUS        current
  DESCRIPTION   "Sets the carrier sweep delay in secs. There is one implied decimal point.
              A value of 215 corresponds to a 21.5 sec sweep delay."
  SYNTAX        INTEGER (0..65535)

TimeConstantType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "d-1"
  STATUS        current
  DESCRIPTION   "Sets time constants in mSecs for feedback or error accumulators.  There is
one implied decimal point.
              A value of 1000 corresponds to a 1.000 sec time constant"
  SYNTAX        INTEGER (0..65535)

EbnoType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "d-2"
  STATUS        current
  DESCRIPTION   "EbNo in db. There is an implied decimal point."
  SYNTAX        INTEGER (0..2500)

EbnoAlarmThresholdType ::= TEXTUAL-CONVENTION
```

```
  DISPLAY-HINT  "d-2"
  STATUS        current
  DESCRIPTION   "EbNo alarm threshold. There is an implied decimal point."
  SYNTAX        INTEGER (0..990)

FirmwareNameType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "15a"
  STATUS        current
  DESCRIPTION   "This is the modem firmware name."
  SYNTAX        OCTET STRING (SIZE (16))

BufferClockSourceType ::= TEXTUAL-CONVENTION
  STATUS        current
  DESCRIPTION    "A clock source for the Rx Buffer"
  SYNTAX         INTEGER {
                 externalScte(1),
                 internalSct(2),
                 externalBnc(3),
                 rxSat(4),
                 externalIdi(5)
                 }

RadTemperature ::= TEXTUAL-CONVENTION
  DISPLAY-HINT   "d-1"
  STATUS         current
  DESCRIPTION    "Temperature in tenths of a degree Celsius."
  SYNTAX         INTEGER (-25..75)

FskPassThruCmdType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "65a"
  STATUS        current
  DESCRIPTION   "This is an ascii message which will be received and then sent as an FSK
message"
  SYNTAX        OCTET STRING (SIZE (65))

FskPassThruReplyType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT  "256a"
  STATUS        current
  DESCRIPTION   "This is an ascii reply to an earlier FSK pass thru command"
  SYNTAX        OCTET STRING (SIZE (256))

-- ------------------------------------------------------------------------------------------------
-- Dmd20 modem non-volatile status information.

radDmd20TxCarrierControl OBJECT-TYPE
  SYNTAX      INTEGER {
              off(1),
              on(2),
              auto(3),
              vsat(4),
              rts(5)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the carrier control mode."
```

```
    ::= { radDmd20ModNVStatus 1 }

radDmd20TxNetworkSpec OBJECT-TYPE
    SYNTAX      INTEGER {
                closedNet(1),
                idr(2),
                ibs(3),
                dropInsert(4),
                dvbSat(5),
                milStd188pt165A(6),
                rfm(7)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Selects the modulator's mode of operation. The mode sets a
                number of parameters within the modulator to meet a set of
                specifications. The purpose is to eliminate additional
                commands and compatibility problems."
    ::= { radDmd20ModNVStatus 2 }

radDmd20TxCarrierLeveldBmX100 OBJECT-TYPE
    SYNTAX      RadTransmitPowerLevel
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Selects the Tx power level in dBm. There is an implied decimal point.
                For example, a value of -100 represents a transmit power level
                of -10.0 dBm."
    ::= { radDmd20ModNVStatus 3 }

radDmd20TxCarrierFrequencyHz OBJECT-TYPE
    SYNTAX      Unsigned32 (50000000..180000000|950000000..2050000000)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Selects IF frequency in Hz steps. The range is 50 MHz to 180 MHz
                for the 70/140 MHz modems and 950 MHz to 2050 MHz for the LBand
                modems. It is based on whatever options are installed."
    ::= { radDmd20ModNVStatus 4 }

radDmd20TxTerrDataRateHz OBJECT-TYPE
    SYNTAX      Unsigned32 (4800..52000000)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Selects the data rate in BPS. The data rate minimum is 4800 bps.
                It varies based on modulation and code rate.
                Please refer to the Dmd product specifications manual
                for maximum Data Rate Limits."
    ::= { radDmd20ModNVStatus 5 }

radDmd20TxStrapCode OBJECT-TYPE
    SYNTAX      INTEGER (0..1000)
    MAX-ACCESS  read-write
    STATUS      current
```

```
  DESCRIPTION
          "Selects the modulator strap code. This is a quick set key that
          configures many of the modem parameters. When a strap code is
          entered, the modulator is automatically configured for the
          corresponding data rate, overhead, code rate, framing, scrambler
          type, and modulation."
  ::= { radDmd20ModNVStatus 6 }

radDmd20TxInnerFecRate OBJECT-TYPE
  SYNTAX     INTEGER {
          none(1),           viterbi1x2(2),    viterbi2x3(3),
          viterbi3x4(4),     viterbi5x6(5),    viterbi7x8(6),
          reserved7(7),      sequential1x2(8), reserved9(9),
          sequential3x4(10), reserved11(11),   sequential7x8(12),
          reserved13(13),    reserved14(14),   trellis2x3(15),
          trellis3x4(16),    trellis5x6(17),   trellis7x8(18),
          trellis8x9(19),    comstream3x4(20), tpc793x2d(21),
          tpc495x3d(22),     tpc1x2(23),       tpc3x4(24),
          tpc7x8(25),        tpc21x44(26),
          tpc750(27),        tpc875(28),       tpc288(29),
          tpc7x8S(30),       tpc5x16(31),
          ldpc1x2(32),       ldpc2x3(33),      ldpc3x4(34),
          ldpc4x5(35),       ldpc5x6(36),      ldpc8x9(37),
          ldpc9x10(38),      ldpc3x5(39)
          }
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
          "Selects Tx code rate and type. The reserved selections are
          unimplemented types reserved for future use."
  ::= { radDmd20ModNVStatus 7 }

radDmd20TxModulationType OBJECT-TYPE
  SYNTAX     INTEGER {
          qpsk(1),
          bpsk(2),
          psk8(3),
          qam16(4),
          oqpsk(5),
          rfm(6),
          qam8(7)
          }
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
          "Selects the modulation type."
  ::= { radDmd20ModNVStatus 8 }

radDmd20TxSatFraming OBJECT-TYPE
  SYNTAX     INTEGER {
          framingNone(1),
          framing96kIdr(2),
          framingIbs(3),
          framingEfAupc(4),
          framingDvb(5),
          framingEdmac(6),
```

```
            framingScc(7),
            framing96k(8),
            framingEfficientDnI(9)
            }
    MAX-ACCESS  read-write
    STATUS      current
     DESCRIPTION
            "Selects framing type."
    ::= { radDmd20ModNVStatus 9 }

radDmd20TxOuterFecEnable OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Disables/enables the ReedSolomon encoder"
    ::= { radDmd20ModNVStatus 10 }

radDmd20TxOuterFecRate OBJECT-TYPE
    SYNTAX      INTEGER {
            rsN126K112(1),
            rsN194K178(2),
            rsN219K201(3),
            rsN225K205(4),
            rsN204K188(5),
            rsCustomNK(6)
            }
    MAX-ACCESS  read-write
    STATUS      obsolete
    DESCRIPTION
            "ReedSolomon N code is the codeword length or block length.
            It is the sum of message and check symbols. N = K + R.
            ReedSolomon K code is the message length or user data. It is
            the number of user data symbols in one message block. Message
            length is K = N - R.

            This object is obsolete, N and K values are no longer limited
            to the five selections listed above.
            see radDmd20TxRsOfecRate"
    ::= { radDmd20ModNVStatus 11 }

radDmd20TxInterleaverDepth OBJECT-TYPE
    SYNTAX      INTEGER {
            interleaverDepth4(1),
            interleaverDepth8(2),
            interleaverDepth12(3)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "ReedSolomon interleaver depth. It can either be a value of 4
            or 8."
    ::= { radDmd20ModNVStatus 12 }

radDmd20TxDropMode OBJECT-TYPE
    SYNTAX      INTEGER {
```

```
            disable(1),
            t1d4(2),
            t1esf(3),
            pcm30(4),
            pcm30c(5),
            pcm31(6),
            pcm31c(7),
            slc96(8),
            t1d4s(9),
            t1esfs(10)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the modulator drop mode. SLC-96 is not yet implemented
            and is reserved for future use."
    ::= { radDmd20ModNVStatus 13 }

radDmd20TxDropMap OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (32))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the modulator drop map. Current mapping of satellite channels to
            dropped terrestrial time slots. Valid drop channels are 1 through 31. If the
            drop mode is either PCM-30 or PCM-30C, then the channel number 16 is reserved
            for signaling."
    ::= { radDmd20ModNVStatus 14 }

radDmd20TxClockSource OBJECT-TYPE
    SYNTAX      INTEGER {
            externalScte(1),
            internalSct(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects Tx clock source. 1 selects the terrestrial clock (Scte),
            2 selects the internal clock (Sct), and 3 the external Bnc clock."
    ::= { radDmd20ModNVStatus 15 }

radDmd20TxClockPolarity OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            inverted(2),
            auto(3)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects clock polarity for Tx terrestrial clock relative to
            Tx data."
    ::= { radDmd20ModNVStatus 16 }

radDmd20TxSctClockSource OBJECT-TYPE
    SYNTAX      INTEGER {
```

```
            internal(1),
            scr(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the Sct clock source to be internal or Scr.  The Scr selection
            is used for loop timing. When internal is selected the Sct oscillator or the Rx
            satellite clock will be used"
    ::= { radDmd20ModNVStatus 17 }

radDmd20TxDataPolarity OBJECT-TYPE
    SYNTAX      INTEGER {
            none(1),
            terrestrial(2),
            baseband(3),
            terrestrialAndBaseband(4)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects data polarity"
    ::= { radDmd20ModNVStatus 18 }

radDmd20TxSpectrum OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            inverted(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Inverts the direction of rotation for PSK modulation."
    ::= { radDmd20ModNVStatus 19 }

radDmd20TxScramblingEnable OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Enables scrambler operation"
    ::= { radDmd20ModNVStatus 20 }

radDmd20TxScramblingType OBJECT-TYPE
    SYNTAX      INTEGER {
            none(1),
            ibsScrambler(2),
            v35Iess(3),
            v35CCITT(4),
            v35EfData(5),
            v35FC(6),
            om73(7),
            rsScrambler(8),
            v35EfRs(9),
            tpcScrambler(10),
            dvbScrambler(11),
```

```
            edmac(12),
            tpcIbs(13),
            tpcEdmac(14),
            v35Comstream(15)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects scrambler type. The reserved settings are unimplemented and
            are set aside for future use."
    ::= { radDmd20ModNVStatus 21 }

radDmd20TxDifferentialEncoder OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Turns the differential encoder off and on."
    ::= { radDmd20ModNVStatus 22 }

radDmd20TxBpskSymbolPairingSwap OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            swapped(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects symbol pairing."
    ::= { radDmd20ModNVStatus 23 }

radDmd20TxEscOverheadType OBJECT-TYPE
    SYNTAX      INTEGER {
            voice(1),
            data(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects IDR overhead type."
    ::= { radDmd20ModNVStatus 24 }

radDmd20TxEsc1GaindBX100 OBJECT-TYPE
    SYNTAX      RadESCGain
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Sets the ESC transmit channel #1 volume in dB."
    ::= { radDmd20ModNVStatus 25 }

radDmd20TxEsc2GaindBX100 OBJECT-TYPE
    SYNTAX      RadESCGain
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
          "Sets the ESC transmit channel #2 volume in dB."
```

```
    ::= { radDmd20ModNVStatus 26 }

radDmd20TxTerrInterfaceType OBJECT-TYPE
    SYNTAX      INTEGER {
                g703BT1Ami(1),
                g703BT1B8zs(2),
                g703BE1(3),
                g703BT2(4),
                g703UE1(5),
                g703UT2(6),
                g703UE2(7),
                rs422(8),
                v35(9),
                rs232(10),
                hssi(11),
                asi(12),
                aasi(13),
                m2p(14),
                dvb(15),
                ethernetBridge(25),
                milStd188pt114A(26),
                rs423(27),
                g703UT3(32),
                g703UE3(33),
                sts1Unbal(34)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Selects the various interface types."
    ::= { radDmd20ModNVStatus 27 }

radDmd20TxAupcLocalMode OBJECT-TYPE
    SYNTAX      INTEGER {
                disabled(1),
                efAupc(2),
                radyne(3)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Sets the Local Aupc functionality. This applies only if the
                AUPC option is installed."
    ::= { radDmd20ModNVStatus 28 }

radDmd20TxAupcRemoteMode OBJECT-TYPE
    SYNTAX      INTEGER {
                disabled(1),
                efAupc(2)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
                "Sets the Remote Aupc functionality. This applies only if EF_AUPC framing is used,
                and the AUPC option is installed."
    ::= { radDmd20ModNVStatus 29 }
```

```
radDmd20TxAupcLocalCarrierLossAction OBJECT-TYPE
  SYNTAX      INTEGER {
              hold(1),
              nominal(2),
              maximum(3)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects what action to take at the local site if the carrier is lost while
              using AUPC. This applies only if AUPC option is enabled."
  ::= { radDmd20ModNVStatus 30 }

radDmd20TxAupcRemoteCarrierLossAction OBJECT-TYPE
  SYNTAX      INTEGER {
              hold(1),
              nominal(2),
              maximum(3)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects what action to take at the remote site if the carrier is lost while
              using AUPC. This applies only if AUPC option is enabled."
  ::= { radDmd20ModNVStatus 31 }

radDmd20TxAupcTrackingRate OBJECT-TYPE
  SYNTAX      INTEGER {
              zeroPointFivedbPerMin(1),
              onedbPerMin(2),
              onePointFivedbPerMin(3),
              twodbPerMin(4),
              twoPointFivedbPerMin(5),
              threeonedbPerMin(6),
              threePointFivedbPerMin(7),
              fourbPerMin(8),
              fourPointFivedbPerMin(9),
              fivedbPerMin(10),
              fivePointFivedbPerMin(11),
              sixdbPerMin(12)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the AUPC tracking rate in dB/min. This applies only if AUPC option
              is enabled."
  ::= { radDmd20ModNVStatus 32 }

radDmd20TxAupcRemoteBasebandLoopback OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Disables/Enables the remote site baseband loopback. This applies only if AUPC
              option is enabled."
```

```
  ::= { radDmd20ModNVStatus 33 }

radDmd20TxAupcRemoteTestPattern OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Disables/Enables the remote site test pattern. This applies only if AUPC
          option is enabled."
  ::= { radDmd20ModNVStatus 34 }

radDmd20TxAupcTargetEbnoDbX100 OBJECT-TYPE
  SYNTAX      INTEGER (400..2000)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the AUPC EbNo. There is an implied decimal point. This applies
          only if the AUPC option is enabled."
  ::= { radDmd20ModNVStatus 35 }

radDmd20TxAupcMinCarrierLeveldBmX100 OBJECT-TYPE
  SYNTAX      RadAupcTransmitPowerLevel
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the AUPC minimum power limit. There is an implied decimal point.
          This applies only if AUPC option is enabled."
  ::= { radDmd20ModNVStatus 36 }

radDmd20TxAupcMaxCarrierLeveldBmX100 OBJECT-TYPE
  SYNTAX      RadAupcTransmitPowerLevel
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the AUPC maximum power limit. There is an implied decimal point.
          This applies only if AUPC option is enabled."
  ::= { radDmd20ModNVStatus 37 }

radDmd20TxAupcNomCarrierLeveldBmX100 OBJECT-TYPE
  SYNTAX      RadAupcTransmitPowerLevel
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the AUPC nominal power level. There is an implied decimal point.
          The nominal level must be between the minimum and the
          maximum power limits. This applies only if AUPC option is enabled."
  ::= { radDmd20ModNVStatus 38 }

radDmd20TxTestPattern OBJECT-TYPE
  SYNTAX      INTEGER {
          normal(1),
          test2047(2),
          testPattern2To15Minus1(3),
          testPattern2To23Minus1(4)
          }
  MAX-ACCESS  read-write
```

```
  STATUS      current
  DESCRIPTION
          "Enables test pattern operation."
  ::= { radDmd20ModNVStatus 39 }

radDmd20TxCircuitName OBJECT-TYPE
  SYNTAX      OCTET STRING (SIZE (11))
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Provides entry of Tx circuit identifier. Circuits can be given up to
          11 character alphanumeric identity such as LINK1."
  ::= { radDmd20ModNVStatus 40 }

radDmd20TxAlarms1Mask OBJECT-TYPE
  SYNTAX      BITS {
          txFpgaFault(0),
          dropDspFault(1),
          txSymbolClockLock(2),
          bit3Reserved(3),
          ifLBandSynthesizerLock(4),
          bit5Reserved(5),
          bit6Reserved(6),
          modSummaryFault(7)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Alarm mask:
          0 = Mask, 1 = Allow"
  ::= { radDmd20ModNVStatus 41 }

radDmd20TxAlarms2Mask OBJECT-TYPE
  SYNTAX      BITS {
          terrClockActivity(0),
          internalClockActivity(1),
          satClockActivity(2),
          dataActivity(3),
          dataAISFault(4),
          clockFallbackFault(5),
          dvbFrameFault(6),
          tpcConflict(7)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Alarm mask:
          0 = Mask, 1 = Allow"
  ::= { radDmd20ModNVStatus 42 }

radDmd20TxForcedAlarms OBJECT-TYPE
  SYNTAX      BITS {
          backwardAlarm1(0),
          backwardAlarm2(1),
          backwardAlarm3(2),
          backwardAlarm4(3),
```

```
            dataAISRequest(4),
            yellowAlarm(5),
            ibsPromptAlarm(6),
            ibsServiceAlarm(7)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Tx forced backward alarms:
            Bit 0 = IDR and IBS backward alarm 1
            Bit 1 = IDR only backward alarm 2
            Bit 2 = IDR only backward alarm 3
            Bit 3 = IDR only backward alarm 4
            Bit 4 = Tx data AIS request
            Bit 5 = Yellow alarm (D&I mode)
            0=Do not force, 1=Force alarm"
    ::= { radDmd20ModNVStatus 43 }

radDmd20TxDropStatusMask OBJECT-TYPE
    SYNTAX      BITS {
            terrFrameFault(0),
            terrMultiframeFault(1),
            terrCrcFault(2),
            bit3Reserved(3),
            bit4Reserved(4),
            bit5Reserved(5),
            bit6Reserved(6),
            bit7Reserved(7)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Alarm mask:
            Bit 0 = Terrestrial frame lock fault (all modes)
            Bit 1 = Terrestrial multi-frame lock fault (PCM-30 and PCM-30C only)
            Bit 2 = Terrestrial CRC lock fault (PCM-30C and PCM-31C only)
            0 = Mask, 1 = Allow"
    ::= { radDmd20ModNVStatus 44 }

radDmd20TxTerrestrialFraming OBJECT-TYPE
    SYNTAX      INTEGER {
            noFraming(1),
            dvb188(2),
            dvb204(3)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the terrestrial framing."
    ::= { radDmd20ModNVStatus 45 }

radDmd20TxSpectralMask OBJECT-TYPE
    SYNTAX      INTEGER {
            intelsat035(1),
            dvbSat025(2),
            dvbSat035(3),
```

```
            milStd188pt165A(4),
            dvbSat020(5)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the transmit spectral mask and roll off."
    ::= { radDmd20ModNVStatus 46 }

radDmd20TxAlarms4Mask OBJECT-TYPE
    SYNTAX      BITS {
            bucCurrentFault(0),
            bucVoltageFault(1),
            ethernetWanMajorAlarm(2),
            bucPllAlarm(3),
            bucOverTempAlarm(4),
            bucSummaryAlarm(5),
            bucOutputEnableAlarm(6),
            bucCommunicationsAlarm(7)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Alarm mask:
            0 = Mask, 1 = Allow"
    ::= { radDmd20ModNVStatus 47 }

radDmd20TxEthFlowControl OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Disables/Enables the flow control of the Ethernet Bridge card."
    ::= { radDmd20ModNVStatus 48 }

radDmd20TxEthDaisyChain OBJECT-TYPE
    SYNTAX      INTEGER {
            disable(1),
            port4(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects PORT 4 Daisy Chain for Ethernet Bridge card."
    ::= { radDmd20ModNVStatus 49 }

radDmd20TxRsOfecRate OBJECT-TYPE
    SYNTAX      INTEGER (0..255255)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This provides the ReedSolomon N and K Values, the integer
            fieldValue = (N * 1000) + K

            Example: a Dvb Code Rate of 188/204 has a field value of 204188 = (204 * 1000) + 188
```

```
            A ReedSolomon N code is the codeword length or block length.
            It is the sum of message and check symbols. N = K + R.
            ReedSolomon K code is the message length or user data. It is
            the number of user data symbols in one message block. Message
            length is K = N - R."
    ::= { radDmd20ModNVStatus 50 }

radDmd20TxIfecInterleaver OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Disables/Enables the IFEC interleaver. Valid only for ldpccodes and turbo codes
            TPC.495 and TPC.793"
    ::= { radDmd20ModNVStatus 51 }

radDmd20TxEsEnhancedEnable OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            enhanced(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the async mode. Enhanced mode is only valid in Closed Net mode."
    ::= { radDmd20ModNVStatus 52 }

radDmd20TxEsSerialControlInterface OBJECT-TYPE
    SYNTAX      INTEGER {
            rs232(1),
            rs485(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the port type for enhanced async. This applies only if the async
            mode is set to enhanced. This affects both transmit and receive interface
            types."
    ::= { radDmd20ModNVStatus 53 }

radDmd20TxEsBaudRate OBJECT-TYPE
    SYNTAX      INTEGER {
            baud150(1),
            baud300(2),
            baud600(3),
            baud1200(4),
            baud2400(5),
            baud4800(6),
            baud9600(7),
            baud19200(8),
            baud38400(9),
            baud57600(10),
            baud115200(11)
            }
    MAX-ACCESS  read-write
    STATUS      current
```

```
  DESCRIPTION
          "Selects the baud rate for enhanced async. This applies only if the async
          mode is set to enhanced."
  ::= { radDmd20ModNVStatus 54 }

radDmd20TxEsBitsPerChar OBJECT-TYPE
  SYNTAX     INTEGER {
          seven(1),
          eight(2)
          }
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
          "Selects the data bits setting for enhanced async. This applies only if the async
          mode is set to enhanced."
  ::= { radDmd20ModNVStatus 55 }

radDmd20TxCarrierDelaySec OBJECT-TYPE
  SYNTAX     INTEGER (0..255)
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
          "LBST systems- selects the minimum number of seconds the modulator waits between
          power-up and enabling the carrier for the first time. This allows time for
          the BUC to stabilize.
          Non-LBST systems- set to zero."
  ::= { radDmd20ModNVStatus 56 }

radDmd20TxSccCtlRatio OBJECT-TYPE
  SYNTAX     INTEGER {
          ratio1(1),
          ratio2(2),
          ratio3(3),
          ratio4(4),
          ratio5(5),
          ratio6(6),
          ratio7(7)
          }
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
          "Selects SCC format overhead ratio."
  ::= { radDmd20ModNVStatus 57 }

radDmd20TxSccInbandRate OBJECT-TYPE
  SYNTAX     Unsigned32 (300..115200)
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
          "Selects the SCC format in-band overhead rate."
  ::= { radDmd20ModNVStatus 58 }

radDmd20TxSctClockPolarity OBJECT-TYPE
  SYNTAX     INTEGER {
          normal(1),
          inverted(2)
```

```
            }
    MAX-ACCESS  read-write
    STATUS      obsolete
    DESCRIPTION
            "Selects Sct clock polarity."
    ::= { radDmd20ModNVStatus 59 }

radDmd20TxCompensation OBJECT-TYPE
    SYNTAX      RadTransmitCompensation
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Sets upto a 1 dBm Tx Power compensation for local cabling and connections"
    ::= { radDmd20ModNVStatus 60 }

radDmd20TxForceAlarmTest OBJECT-TYPE
    SYNTAX      BITS {
            forceMajorAlarmTest(0)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Tx forced alarms:
            0=Do not force, 1=Force alarm"
    ::= { radDmd20ModNVStatus 61 }

radDmd20TxAsyncInbandRate OBJECT-TYPE
    SYNTAX      INTEGER {
            inband150(1),
            inband300(2),
            inband600(3),
            inband1200(4),
            inband2400(5),
            inband4800(6),
            inband9600(7),
            inband19200(8),
            inband38400(9),
            inband57600(10),
            inband115200(11)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects Efficient D&I format Inband Rate"
    ::= { radDmd20ModNVStatus 62 }

radDmd20TxEthQosType OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            portBased(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects Quality of Service Type."
    ::= { radDmd20ModNVStatus 63 }
```

```
radDmd20TxEthQosQue OBJECT-TYPE
  SYNTAX      INTEGER {
              fairWeighted(1),
              strictPriority(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects Quality of Service Type queueing method."
  ::= { radDmd20ModNVStatus 64 }
-- ------------------------------------------------------------------------------------------------
-- Dmd20 modulator status information.

radDmd20TxAlarms1 OBJECT-TYPE
  SYNTAX      BITS {
              txFpgaFault(0),
              dropDspFault(1),
              txSymbolClockLock(2),
              bit3Reserved(3),
              ifLBandSynthesizerLock(4),
              bit5Reserved(5),
              bit6Reserved(6),
              modSummaryFault(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20ModStatus 1 }

radDmd20TxAlarms2 OBJECT-TYPE
  SYNTAX      BITS {
              terrClockActivity(0),
              internalClockActivity(1),
              satClockActivity(2),
              dataActivity(3),
              dataAISFault(4),
              clockFallbackFault(5),
              dvbFrameFault(6),
              tpcConflict(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20ModStatus 2 }

radDmd20TxDropStatus OBJECT-TYPE
  SYNTAX      BITS {
              terrFrameFault(0),
              terrMultiframeFault(1),
```

```
            terrCrcFault(2),
            bit3Reserved(3),
            bit4Reserved(4),
            bit5Reserved(5),
            bit6Reserved(6),
            bit7Reserved(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            Bit 0 = Terrestrial frame lock fault (all modes)
            Bit 1 = Terrestrial multi-frame lock fault (PCM-30 and PCM-30C only)
            Bit 2 = Terrestrial CRC lock fault (PCM-30C and PCM-31C only)

            Activity/Lock: 1 = Pass, 0 = Fail
            Alarm/Fault:   0 = Pass, 1 = Fail"
    ::= { radDmd20ModStatus 3 }

radDmd20TxBackwardAlarms OBJECT-TYPE
    SYNTAX      BITS {
            idrBackwardAlarm1(0),
            idrBackwardAlarm2(1),
            idrBackwardAlarm3(2),
            idrBackwardAlarm4(3),
            bit4Reserved(4),
            bit5Reserved(5),
            ibsPromptAlarm(6),
            ibsServiceAlarm(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Not transmitted, 1 = Transmitted"
    ::= { radDmd20ModStatus 4 }

radDmd20TxLatchedAlarms1 OBJECT-TYPE
    SYNTAX      BITS {
            txFpgaFault(0),
            dropDspFault(1),
            txSymbolClockLock(2),
            bit3Reserved(3),
            ifLBandSynthesizerLock(4),
            bit5Reserved(5),
            bit6Reserved(6),
            modSummaryFault(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Pass, 1 = Fail"
    ::= { radDmd20ModStatus 5 }

radDmd20TxLatchedAlarms2 OBJECT-TYPE
```

```
  SYNTAX      BITS {
              terrClockActivity(0),
              internalClockActivity(1),
              satClockActivity(2),
              dataActivity(3),
              dataAISFault(4),
              clockFallbackFault(5),
              dvbFrameFault(6),
              tpcConflict(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              0 = Pass, 1 = Fail"
  ::= { radDmd20ModStatus 6 }

radDmd20TxSymbolRateHz OBJECT-TYPE
  SYNTAX      Unsigned32 (9600..10000000)
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "Modulator symbol rate"
  ::= { radDmd20ModStatus 7 }

radDmd20TxAlarms4 OBJECT-TYPE
  SYNTAX      BITS {
              bucCurrentFault(0),
              bucVoltageFault(1),
              ethernetWanMajorAlarm(2),
              bucPllAlarm(3),
              bucOverTempAlarm(4),
              bucSummaryAlarm(5),
              bucOutputEnableAlarm(6),
              bucCommunicationsAlarm(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20ModStatus 8 }

radDmd20TxLatchedAlarms4 OBJECT-TYPE
  SYNTAX      BITS {
              bucCurrentFault(0),
              bucVoltageFault(1),
              ethernetWanMajorAlarm(2),
              bucPllAlarm(3),
              bucOverTempAlarm(4),
              bucSummaryAlarm(5),
              bucOutputEnableAlarm(6),
              bucCommunicationsAlarm(7)
              }
  MAX-ACCESS  read-only
```

```
  STATUS      current
  DESCRIPTION
          "A bit field.  On startup, the agent initializes this to the value '00000000'B.
          Activity/Lock: 1 = Pass, 0 = Fail
          Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20ModStatus 9 }

-- ---------------------------------------------------------------------------------------------------
-- Dmd20 demodulator non-volatile status information.

radDmd20RxNetworkSpec OBJECT-TYPE
  SYNTAX      INTEGER {
          closednet(1),
          idr(2),
          ibs(3),
          dropInsert(4),
          dvbSat(5),
          milStd188pt165A(6),
          rfm(7)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the demodulator's mode of operation. The mode sets a
          number of parameters within the demodulator to meet a set of
          specifications. The purpose is to eliminate additional
          commands and compatibility problems."
  ::= { radDmd20DemodNVStatus 1 }

radDmd20RxCarrierFrequencyHz OBJECT-TYPE
  SYNTAX      Unsigned32 (50000000..180000000|950000000..2050000000)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects IF frequency in Hz steps. The range is 50 MHz to 180 MHz
          for the 70/140 MHz type modems and 950 MHz to 2050 MHz for the
          LBand modems."
  ::= { radDmd20DemodNVStatus 2 }

radDmd20RxTerrDataRateHz OBJECT-TYPE
  SYNTAX      Unsigned32 (4800..52000000)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the data rate in BPS. The data rate minimum is 4800 bps.
          It varies based on modulation and code rate.
          Please refer to the Dmd product specifications manual
          for maximum Data Rate Limits."
  ::= { radDmd20DemodNVStatus 3 }

radDmd20RxStrapCode OBJECT-TYPE
  SYNTAX      INTEGER (0..1000)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the demodulator strap code. This is a quick set key that
```

```
            configures many of the modem parameters. When a strap code is
            entered, the demodulator is automatically configured for the
            corresponding data rate, overhead, code rate, framing, descrambler
            type, and demodulation."
    ::= { radDmd20DemodNVStatus 4 }

radDmd20RxInnerFecRate OBJECT-TYPE
    SYNTAX      INTEGER {
            none(1),            viterbi1x2(2),    viterbi2x3(3),
            viterbi3x4(4),      viterbi5x6(5),    viterbi7x8(6),
            reserved7(7),       sequential1x2(8), reserved9(9),
            sequential3x4(10),  reserved11(11),   sequential7x8(12),
            reserved13(13),     reserved14(14),   trellis2x3(15),
            trellis3x4(16),     trellis5x6(17),   trellis7x8(18),
            trellis8x9(19),     comstream3x4(20), tpc793x2d(21),
            tpc495x3d(22),      tpc1x2(23),       tpc3x4(24),
            tpc7x8(25),         tpc21x44(26),
            tpc750(27),         tpc875(28),
            ldpc1x2(32),        ldpc2x3(33),      ldpc3x4(34),
            ldpc4x5(35),        ldpc5x6(36),      ldpc8x9(37),
            ldpc9x10(38),       ldpc3x5(39)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects Rx code rate and type. The reserved selections are
            unimplemented types reserved for future use."
    ::= { radDmd20DemodNVStatus 5 }

radDmd20RxModulationType OBJECT-TYPE
    SYNTAX      INTEGER {
            qpsk(1),
            bpsk(2),
            psk8(3),
            qam16(4),
            oqpsk(5),
            rfm(6),
            qam8(7)

            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the demodulation type."
    ::= { radDmd20DemodNVStatus 6 }

radDmd20RxSatFraming OBJECT-TYPE
    SYNTAX      INTEGER {
            framingNone(1),
            framing96kIdr(2),
            framingIbs(3),
            framingEfAupc(4),
            framingDvb(5),
            framingEdmac(6),
            framingScc(7),
            framing96k(8),
```

```
            framingEfficientDnI(9)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects framing type."
    ::= { radDmd20DemodNVStatus 7 }

radDmd20RxOuterFecEnable OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Disables/enables the ReedSolomon decoder"
    ::= { radDmd20DemodNVStatus 8 }

radDmd20RxOuterFecRate OBJECT-TYPE
    SYNTAX      INTEGER {
            rsN126K112(1),
            rsN194K178(2),
            rsN219K201(3),
            rsN225K205(4),
            rsN204K188(5),
            rsCustomNK(6)
            }
    MAX-ACCESS  read-write
    STATUS      obsolete
    DESCRIPTION
            "ReedSolomon N code is the codeword length or block length.
            It is the sum of message and check symbols. N = K + R.
            ReedSolomon K code is the message length or user data. It is
            the number of user data symbols in one message block. Message
            length is K = N - R.

            This object is obsolete, N and K values are no longer limited
            to the five selections listed above.
            see radDmd20RxRsOfecRate"
    ::= { radDmd20DemodNVStatus 9 }

radDmd20RxInterleaverDepth OBJECT-TYPE
    SYNTAX      INTEGER {
            interleaverDepth4(1),
            interleaverDepth8(2),
            interleaverDepth12(3)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "ReedSolomon interleaver depth. It can either be a value of 4
            or 8."
    ::= { radDmd20DemodNVStatus 10 }

radDmd20RxInsertMode OBJECT-TYPE
    SYNTAX      INTEGER {
            disable(1),
            t1d4(2),
```

```
            t1esf(3),
            pcm30(4),
            pcm30c(5),
            pcm31(6),
            pcm31c(7),
            slc96(8),
            t1d4s(9),
            t1esfs(10)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the demodulator insert mode. SLC-96 is not yet implemented and
            is reserved for future use."
    ::= { radDmd20DemodNVStatus 11 }

radDmd20RxInsertMap OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (32))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the demodulator insert map. Current mapping of satellite channels
            to insert terrestrial time slots. Valid insert channels are 1 through 31.
            If the insert mode is either PCM-30 or PCM-30C, then the channel number
            16 is invalid. It is used for signaling."
    ::= { radDmd20DemodNVStatus 12 }

radDmd20RxBufferClockSource OBJECT-TYPE
    SYNTAX      BufferClockSourceType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The active Rx Buffer Clock Source, Note: this is not necessarily the primary source"
    ::= { radDmd20DemodNVStatus 13 }

radDmd20RxBufferClockPolarity OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            inverted(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects Rx buffer clock polarity."
    ::= { radDmd20DemodNVStatus 14 }

radDmd20RxBufferSize OBJECT-TYPE
    SYNTAX      INTEGER (0..64)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects Rx buffer size in msecs."
    ::= { radDmd20DemodNVStatus 15 }

radDmd20RxDataPolarity OBJECT-TYPE
    SYNTAX      INTEGER {
```

```
            none(1),
            terrestrial(2),
            baseband(3),
            terrestrialAndBaseband(4)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects data polarity"
    ::= { radDmd20DemodNVStatus 16 }

radDmd20RxSpectrum OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            inverted(2),
            autoDetect(3)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Inverts the direction of rotation for PSK demodulation."
    ::= { radDmd20DemodNVStatus 17 }

radDmd20RxDescramblingEnable OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Enables descrambler operation"
    ::= { radDmd20DemodNVStatus 18 }

radDmd20RxDescramblingType OBJECT-TYPE
    SYNTAX      INTEGER {
            none(1),
            ibsDescrambler(2),
            v35Iess(3),
            v35CCITT(4),
            v35EfData(5),
            v36FC(6),
            om73(7),
            rsDescrambler(8),
            v35EfRs(9),
            tpcDescrambler(10),
            dvbDescrambler(11),
            edmac(12),
            tpcIbs(13),
            tpcEdmac(14),
            v35Comstream(15)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects scrambler type. The reserved settings are unimplemented and
            are set aside for future use."
    ::= { radDmd20DemodNVStatus 19 }
```

```
radDmd20RxDifferentialDecoder OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Disables/enables differential decoder"
  ::= { radDmd20DemodNVStatus 20 }

radDmd20RxBpskSymbolPairingSwap OBJECT-TYPE
  SYNTAX      INTEGER {
          normal(1),
          swapped(2)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects symbol pairing."
  ::= { radDmd20DemodNVStatus 21 }

radDmd20RxT1E1FrameSource OBJECT-TYPE
  SYNTAX      INTEGER {
          internal(1),
          external(2),
          idiDdoLoopBack(3)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "This applies only if an IDR or IBS interface card is installed."
  ::= { radDmd20DemodNVStatus 22 }

radDmd20RxExtClockSource OBJECT-TYPE
  SYNTAX      BufferClockSourceType
  MAX-ACCESS  read-write
  STATUS      deprecated
  DESCRIPTION
          "Formerly, selected the external clock source"
  ::= { radDmd20DemodNVStatus 23 }

radDmd20RxCarrierSweepRange OBJECT-TYPE
  SYNTAX      INTEGER (0..255)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "The value will used as a negative and positive limit
          Example: 25 implies [-25 .. +25]"
  ::= { radDmd20DemodNVStatus 24 }

radDmd20RxCarrierLevelLimitdBmX100 OBJECT-TYPE
  SYNTAX      INTEGER (30..90)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects lower level limit in 1 dB steps, implied sign"
  ::= { radDmd20DemodNVStatus 25 }
```

```
radDmd20RxEscOverheadType OBJECT-TYPE
  SYNTAX      INTEGER {
              voice(1),
              data(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects IDR overhead type. This applies only if an IDR or IBS interface card is
              installed and the receive mode is set to IDR mode. If not ignore."
  ::= { radDmd20DemodNVStatus 26 }

radDmd20RxEsc1GaindBX100 OBJECT-TYPE
  SYNTAX      RadESCGain
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Sets the ESC receive channel #1 volume in dB. This applies only if an IDR or IBS
              interface card is installed and the receive mode is set to IDR mode. If not ignore."
  ::= { radDmd20DemodNVStatus 27 }

radDmd20RxEsc2GaindBX100 OBJECT-TYPE
  SYNTAX      RadESCGain
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Sets the ESC receive channel #2 volume in dB. This applies only if an IDR or IBS
              interface card is installed and the receive mode is set to IDR mode. If not ignore."
  ::= { radDmd20DemodNVStatus 28 }

radDmd20RxTerrInterfaceType OBJECT-TYPE
  SYNTAX      INTEGER {
              g703BT1Ami(1),
              g703BT1B8zs(2),
              g703BE1(3),
              g703BT2(4),
              g703UE1(5),
              g703UT2(6),
              g703UE2(7),
              rs422(8),
              v35(9),
              rs232(10),
              hssi(11),
              asi(12),
              aasi(13),
              m2p(14),
              dvb(15),
              ethernetBridge(25),
              milStd188pt114A(26),
              rs423(27),
              g703UT3(32),
              g703UE3(33),
              sts1Unbal(34)
              }
  MAX-ACCESS  read-write
  STATUS      current
```

```
  DESCRIPTION
          "Selects the various interface types."
  ::= { radDmd20DemodNVStatus 29 }

radDmd20RxEsEnhancedEnable OBJECT-TYPE
  SYNTAX      INTEGER {
          normal(1),
          enhanced(2)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the async mode. Enhanced mode is only valid in Closed Net mode."
  ::= { radDmd20DemodNVStatus 30 }

radDmd20RxEsSerialControlInterface OBJECT-TYPE
  SYNTAX      INTEGER {
          rs232(1),
          rs485(2)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the port type for enhanced async. This applies only if the async
          mode is set to enhanced."
  ::= { radDmd20DemodNVStatus 31 }

radDmd20RxEsBaudRate OBJECT-TYPE
  SYNTAX      INTEGER {
          baud150(1),
          baud300(2),
          baud600(3),
          baud1200(4),
          baud2400(5),
          baud4800(6),
          baud9600(7),
          baud19200(8),
          baud38400(9),
          baud57600(10),
          baud115200(11)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the baud rate for enhanced async. This applies only if the async
          mode is set to enhanced."
  ::= { radDmd20DemodNVStatus 32 }

radDmd20RxEsBitsPerChar OBJECT-TYPE
  SYNTAX      INTEGER {
          seven(1),
          eight(2)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
```

```
            "Selects the data bits setting for enhanced async. This applies only if the async
            mode is set to enhanced."
    ::= { radDmd20DemodNVStatus 33 }

radDmd20RxTestPattern OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            test2047(2),
            testPattern2To15Minus1(3),
            testPattern2To23Minus1(4)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Enables test pattern operation."
    ::= { radDmd20DemodNVStatus 34 }

radDmd20RxCircuitName OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (11))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Provides entry of Rx circuit identifier. Circuits can be given up to 11
            character alphanumeric identity such as LINK1."
    ::= { radDmd20DemodNVStatus 35 }

radDmd20RxForcedAlarms OBJECT-TYPE
    SYNTAX      BITS {
            forceSummaryAlarm(0)
            }
    MAX-ACCESS  read-write
    STATUS      deprecated
    DESCRIPTION
            "Rx forced alarms:
            0=Do not force, 1=Force alarm
            This alarm was improperly titled and is being deprecated, use
radDmd20RxForceAlarmTest in future"
    ::= { radDmd20DemodNVStatus 36 }

radDmd20RxAlarms1Mask OBJECT-TYPE
    SYNTAX      BITS {
            rxFpgaFault(0),
            carrierFault(1),
            multiframeSyncFault(2),
            frameSyncFault(3),
            ibsBerFault(4),
            satelliteAisFault(5),
            dataActivity(6),
            agcLevelFault(7)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Alarm mask:
            0 = Mask, 1 = Allow"
    ::= { radDmd20DemodNVStatus 37 }
```

```
radDmd20RxAlarms2Mask OBJECT-TYPE
  SYNTAX      BITS {
              bufferUnderflow(0),
              bufferOverflow(1),
              bufferNearEmpty(2),
              bufferNearFull(3),
              ofecDecoderFault(4),
              deinterleaverFault(5),
              uncorrectedWordFault(6),
              summaryFault(7)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Alarm mask:
              0 = Mask, 1 = Allow"
  ::= { radDmd20DemodNVStatus 38 }

radDmd20RxAlarms3Mask OBJECT-TYPE
  SYNTAX      BITS {
              lBandSynthesizerLock(0),
              insertDspFault(1),
              bufferClockLock(2),
              viterbiDecoderLock(3),
              sequentialDecoderLock(4),
              testPatternLock(5),
              externalReferenceLock(6),
              carrierLevelFault(7)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Alarm mask:
              0 = Mask, 1 = Allow"
  ::= { radDmd20DemodNVStatus 39 }

radDmd20RxAlarms4Mask OBJECT-TYPE
  SYNTAX      BITS {
              bufferClockActivity(0),
              externalBncActivity(1),
              satelliteClockActivity(2),
              externalIdiClockActivity(3),
              externalReferenceActivity(4),
              hsReferenceActivity(5),
              bit6Reserved(6),
              ebnoFault(7)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Alarm mask:
              0 = Mask, 1 = Allow"
  ::= { radDmd20DemodNVStatus 40 }

radDmd20RxAlarms5Mask OBJECT-TYPE
```

```
  SYNTAX      BITS {
              trellisDecoderLock(0),
              ifecLockFault(1),
              insertSignalingFault(2),
              tpcConflict(3),
              bit4Reserved(4),
              bit5Reserved(5),
              dvbFrameFault(6),
              bit7Reserved(7)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Alarm mask:
              0 = Mask, 1 = Allow"
  ::= { radDmd20DemodNVStatus 41 }

radDmd20RxInsertStatusMask OBJECT-TYPE
  SYNTAX      BITS {
              terrFrameFault(0),
              terrMultiframeFault(1),
              terrCrcFault(2),
              bit3Reserved(3),
              bit4Reserved(4),
              bit5Reserved(5),
              bit6Reserved(6),
              bit7Reserved(7)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Alarm mask:
              0 = Mask, 1 = Allow"
  ::= { radDmd20DemodNVStatus 42 }

radDmd20RxTerrestrialFraming OBJECT-TYPE
  SYNTAX      INTEGER {
              noFraming(1),
              dvb188(2),
              dvb204(3)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the receive terrestrial framing."
  ::= { radDmd20DemodNVStatus 43 }

radDmd20RxTerrestrialStreaming OBJECT-TYPE
  SYNTAX      INTEGER {
              packetOutput(1),
              byteOutput(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the receive terrestrial streaming."
```

```
  ::= { radDmd20DemodNVStatus 44 }

radDmd20RxAlarms6Mask OBJECT-TYPE
  SYNTAX      BITS {
              lnbCurrentFault(0),
              lnbVoltageFault(1),
              ethernetWanMajorAlarm(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Alarm mask:
              0 = Mask, 1 = Allow"
  ::= { radDmd20DemodNVStatus 45 }

radDmd20RxCarrierReacqRange OBJECT-TYPE
  SYNTAX      INTEGER (0..65535)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Reacquisition range is -/+ selected value."
  ::= { radDmd20DemodNVStatus 46 }

radDmd20RxRsOfecRate OBJECT-TYPE
  SYNTAX      INTEGER (0..255255)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "This provides the ReedSolomon N and K Values, the integer
              fieldValue = (N * 1000) + K

              Example: a Dvb Code Rate of 188/204 has a field value of 204188 = (204 * 1000) + 188

              A ReedSolomon N code is the codeword length or block length.
              It is the sum of message and check symbols. N = K + R.
              ReedSolomon K code is the message length or user data. It is
              the number of user data symbols in one message block. Message
              length is K = N - R."
  ::= { radDmd20DemodNVStatus 47 }

radDmd20RxIfecInterleaver OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Disables/Enables the TPC interleaver. Valid only for ldpc codes and turbo codes
              TPC.495 and TPC.793"
  ::= { radDmd20DemodNVStatus 48 }

radDmd20RxCarrierSweepDelay OBJECT-TYPE
  SYNTAX      CarrierSweepDelayType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Sets the carrier sweep delay in secs. There is an implied decimal point.
              A value of 215 corresponds to a 21.5 sec sweep delay."
```

```
  ::= { radDmd20DemodNVStatus 49 }

radDmd20RxEbnoAlarmThreshold OBJECT-TYPE
  SYNTAX      EbnoAlarmThresholdType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "EbNo alarm threshold. There is an implied decimal point."
  ::= { radDmd20DemodNVStatus 50 }

radDmd20RxBufferReset OBJECT-TYPE
  SYNTAX      Unsigned32 (0..4294967295)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Any write to this object resets the buffer."
  ::= { radDmd20DemodNVStatus 51 }

radDmd20RxRestartTestPattern  OBJECT-TYPE
  SYNTAX      Unsigned32 (0..4294967295)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Any write to this object restarts the test pattern."
  ::= { radDmd20DemodNVStatus 52 }

radDmd20RxSccCtlRatio OBJECT-TYPE
  SYNTAX      INTEGER {
              ratio1(1),
              ratio2(2),
              ratio3(3),
              ratio4(4),
              ratio5(5),
              ratio6(6),
              ratio7(7)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects SCC format overhead ratio."
  ::= { radDmd20DemodNVStatus 53 }

radDmd20RxSccInbandRate OBJECT-TYPE
  SYNTAX      Unsigned32 (300..115200)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the SCC format in-band overhead rate."
  ::= { radDmd20DemodNVStatus 54 }

radDmd20RxFastAcquisition OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Disables/enables the Rx fast acquisition capability"
```

```
  ::= { radDmd20DemodNVStatus 55 }

radDmd20RxSpectralMask OBJECT-TYPE
  SYNTAX      INTEGER {
              intelsat035(1),
              dvbSat025(2),
              dvbSat035(3),
              milStd188pt165A(4),
              dvbSat020(5)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the receive spectral mask and roll off."
  ::= { radDmd20DemodNVStatus 56 }

radDmd20RxAdjacentCarrierType OBJECT-TYPE
  SYNTAX      INTEGER {
              normal(1),
              highPower(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "User indicates adjacent carrier as normal or high power.
              Unit will increase or decrease post decimation gain appropriately."
  ::= { radDmd20DemodNVStatus 57 }

radDmd20RxForceAlarmTest OBJECT-TYPE
  SYNTAX      BITS {
              forceMajorAlarmTest(0)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Rx forced alarms:
              0=Do not force, 1=Force alarm"
  ::= { radDmd20DemodNVStatus 58 }

radDmd20NumRxBufferClockSources OBJECT-TYPE
  SYNTAX      Unsigned32 (1..5)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the number of clock sources to be considered for use"
  ::= { radDmd20DemodNVStatus 59 }


radDmd20RxBufferClockSource1 OBJECT-TYPE
  SYNTAX      BufferClockSourceType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects the primary Rx Buffer Clock Source"
  ::= { radDmd20DemodNVStatus 60 }
```

```
radDmd20RxBufferClockSource2 OBJECT-TYPE
  SYNTAX      BufferClockSourceType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the second Rx Buffer Clock Source, e.g. the first fallback
          Each radDmd20RxBufferClockSource should be unique
          "
  ::= { radDmd20DemodNVStatus 61 }

radDmd20RxBufferClockSource3 OBJECT-TYPE
  SYNTAX      BufferClockSourceType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the third Rx Buffer Clock Source, e.g. the second fallback
          Each radDmd20RxBufferClockSource should be unique
          "
  ::= { radDmd20DemodNVStatus 62 }

radDmd20RxBufferClockSource4 OBJECT-TYPE
  SYNTAX      BufferClockSourceType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the fourth Rx Buffer Clock Source, e.g. the third fallback
          Each radDmd20RxBufferClockSource should be unique
          "
  ::= { radDmd20DemodNVStatus 63 }


radDmd20RxBufferClockSource5 OBJECT-TYPE
  SYNTAX      BufferClockSourceType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the fifth Rx Buffer Clock Source, e.g. the fourth fallback
          Each radDmd20RxBufferClockSource should be unique
          "
  ::= { radDmd20DemodNVStatus 64 }

radDmd20RxAsyncInbandRate OBJECT-TYPE
  SYNTAX      INTEGER {
          inband150(1),
          inband300(2),
          inband600(3),
          inband1200(4),
          inband2400(5),
          inband4800(6),
          inband9600(7),
          inband19200(8),
          inband38400(9),
          inband57600(10),
          inband115200(11)
          }
```

```
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects Efficient D&I format Inband Rate."
  ::= { radDmd20DemodNVStatus 65 }

radDmd20RxRotationAmbiguity OBJECT-TYPE
  SYNTAX      INTEGER {
          rotationAmbiguity0(1),
          rotationAmbiguity1(2),
          rotationAmbiguity2(3),
          rotationAmbiguity3(4),
          rotationAmbiguity4(5),
          rotationAmbiguity5(6),
          rotationAmbiguity6(7),
          rotationAmbiguity7(8)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the rotational ambiguity desired from modulation map"
  ::= { radDmd20DemodNVStatus 66 }

radDmd20RxRfmTimeConstant OBJECT-TYPE
  SYNTAX      TimeConstantType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
"Sets time constants in mSecs for the Rx Rfm Agc accumulator.  There is one implied decimal
point.  A value of 1000 corresponds to a 1.000 sec time constant"
  ::= { radDmd20DemodNVStatus 67 }

-- ------------------------------------------------------------------------------------------------
-- Dmd20 demodulator volatile status information.

radDmd20RxAlarms1 OBJECT-TYPE
  SYNTAX      BITS {
          rxFpgaFault(0),
          carrierFault(1),
          multiframeSyncFault(2),
          frameSyncFault(3),
          ibsBerFault(4),
          satelliteAisFault(5),
          dataActivity(6),
          agcLevelFault(7)
          }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "A bit field.  On startup, the agent initializes this to the value '00000000'B.
          Activity/Lock: 1 = Pass, 0 = Fail
          Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 1 }

radDmd20RxAlarms2 OBJECT-TYPE
  SYNTAX      BITS {
```

```
            bufferUnderflow(0),
            bufferOverflow(1),
            bufferNearEmpty(2),
            bufferNearFull(3),
            ofecDecoderFault(4),
            deinterleaverFault(5),
            uncorrectedWordFault(6),
            summaryFault(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            Activity/Lock: 1 = Pass, 0 = Fail
            Alarm/Fault:   0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 2 }

radDmd20RxAlarms3 OBJECT-TYPE
    SYNTAX      BITS {
            lBandSynthesizerLock(0),
            insertDspFault(1),
            bufferClockLock(2),
            viterbiDecoderLock(3),
            sequentialDecoderLock(4),
            testPatternLock(5),
            externalReferenceLock(6),
            carrierLevelFault(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            Activity/Lock: 1 = Pass, 0 = Fail
            Alarm/Fault:   0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 3 }

radDmd20RxAlarms4 OBJECT-TYPE
    SYNTAX      BITS {
            bufferClockActivity(0),
            externalBncActivity(1),
            satelliteClockActivity(2),
            externalIdiClockActivity(3),
            externalReferenceActivity(4),
            hsReferenceActivity(5),
            bit6Reserved(6),
            ebnoFault(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            Activity/Lock: 1 = Pass, 0 = Fail
            Alarm/Fault:   0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 4 }

radDmd20RxAlarms5 OBJECT-TYPE
```

```
  SYNTAX      BITS {
              trellisDecoderLock(0),
              ifecLockFault(1),
              insertSignalingFault(2),
              tpcConflict(3),
              bit4Reserved(4),
              bit5Reserved(5),
              dvbFrameFault(6)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 5 }

radDmd20RxInsertStatus OBJECT-TYPE
  SYNTAX      BITS {
              terrFrameFault(0),
              terrMultiframeFault(1),
              terrCrcFault(2),
              bit3Reserved(3),
              bit4Reserved(4),
              bit5Reserved(5),
              bit6Reserved(6),
              bit7Reserved(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 6 }

radDmd20RxBackwardAlarms OBJECT-TYPE
  SYNTAX      BITS {
              idrBackwardAlarm1(0),
              idrBackwardAlarm2(1),
              idrBackwardAlarm3(2),
              idrBackwardAlarm4(3),
              bit4Reserved(4),
              bit5Reserved(5),
              bit6Reserved(6),
              bit7Reserved(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 7 }

radDmd20RxLatchedAlarms1 OBJECT-TYPE
```

```
  SYNTAX      BITS {
              rxFpgaFault(0),
              carrierFault(1),
              multiframeSyncFault(2),
              frameSyncFault(3),
              ibsBerFault(4),
              satelliteAisFault(5),
              dataActivity(6),
              agcLevelFault(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 8 }

radDmd20RxLatchedAlarms2 OBJECT-TYPE
  SYNTAX      BITS {
              bufferUnderflow(0),
              bufferOverflow(1),
              bufferNearEmpty(2),
              bufferNearFull(3),
              ofecDecoderFault(4),
              deinterleaverFault(5),
              uncorrectedWordFault(6),
              summaryFault(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 9 }

radDmd20RxLatchedAlarms3 OBJECT-TYPE
  SYNTAX      BITS {
              lBandSynthesizerLock(0),
              insertDspFault(1),
              bufferClockLock(2),
              viterbiDecoderLock(3),
              sequentialDecoderLock(4),
              testPatternLock(5),
              externalReferenceLock(6),
              carrierLevelFault(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              0 = Pass, 1 = Fail"
  ::= { radDmd20DemodStatus 10 }

radDmd20RxLatchedAlarms4 OBJECT-TYPE
  SYNTAX      BITS {
              bufferClockActivity(0),
```

```
            externalBncActivity(1),
            satelliteClockActivity(2),
            externalIdiClockActivity(3),
            externalReferenceActivity(4),
            hsReferenceActivity(5),
            bit6Reserved(6),
            ebnoFault(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 11 }

radDmd20RxLatchedAlarms5 OBJECT-TYPE
    SYNTAX      BITS {
            trellisDecoderLock(0),
            ifecLockFault(1),
            insertSignalingFault(2),
            tpcConflict(3),
            bit4Reserved(4),
            bit5Reserved(5),
            dvbFrameFault(6),
            bit7Reserved(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 12 }

radDmd20RxBerEbnoStatus OBJECT-TYPE
    SYNTAX      INTEGER (0..255)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B
            Bit 0 = Raw BER and corrected BER status. 1 = Valid
            Bit 1 = Test BER status              1 = Valid
            Bit 2,3 = EbNo status
              0 = EbNo invalid
              1 = EbNo valid
              2 = EbNo is smaller than indicated value
              3 = EbNo is greater than indicated value
            Bit 4..7 = Reserved"
    ::= { radDmd20DemodStatus 13 }

radDmd20RxEbno OBJECT-TYPE
    SYNTAX      EbnoType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Estimated EbNo as seen by the demodulator, 2 implied decimal places."
    ::= { radDmd20DemodStatus 14 }
```

```
radDmd20RxBufferLevel OBJECT-TYPE
  SYNTAX      INTEGER (0..100)
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Pleisiochronous buffer percent full status. Unsigned binary value in 1% steps."
  ::= { radDmd20DemodStatus 15 }

radDmd20RxCarrierLeveldBmX100 OBJECT-TYPE
  SYNTAX      RadReceivePowerLevel
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Estimated receive signal level, implied decimal point"
  ::= { radDmd20DemodStatus 16 }

radDmd20RxBitErrorCount OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Shows the number of errors detected in the data stream"
  ::= { radDmd20DemodStatus 17 }

radDmd20RxTestPatternErrorCount OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Shows the number of errors detected by the test pattern checker."
  ::= { radDmd20DemodStatus 18 }

radDmd20RxLossOfTerrInputSignal OBJECT-TYPE
  SYNTAX      INTEGER {
          normal(1),
          lossOfSignal(2)
          }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Status of terrestrial input"
  ::= { radDmd20DemodStatus 19 }

radDmd20RxSymbolRateHz OBJECT-TYPE
  SYNTAX      Unsigned32 (9600..10000000)
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Demodulator symbol rate."
  ::= { radDmd20DemodStatus 20 }

radDmd20RxAlarms6 OBJECT-TYPE
  SYNTAX      BITS {
          lnbCurrentFault(0),
          lnbVoltageFault(1),
```

```
            ethernetWanMajorAlarm(2)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            Activity/Lock: 1 = Pass, 0 = Fail
            Alarm/Fault:   0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 21 }

radDmd20RxLatchedAlarms6 OBJECT-TYPE
    SYNTAX      BITS {
            lnbCurrentFault(0),
            lnbVoltageFault(1),
            ethernetWanMajorAlarm(2)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Pass, 1 = Fail"
    ::= { radDmd20DemodStatus 22 }

radDmd20RxEthPktErrorCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Ethernet Bridge card packet error count."
    ::= { radDmd20DemodStatus 23 }

radDmd20RxEthPktTotalCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Ethernet Bridge card total packet count."
    ::= { radDmd20DemodStatus 24 }

radDmd20RxEthJs1PortStatus OBJECT-TYPE
    SYNTAX      INTEGER {
            down(1),
            unresolved(2),
            halfDuplex10mbs(3),
            halfDuplex100mbs(4),
            fullDuplex10mbs(5),
            fullDuplex100mbs(6),
            portNotUsed(7),
            halfDuplex1000mbs(8),
            fullDuplex1000mbs(9)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Ethernet bridge JS 1 port status."
    ::= { radDmd20DemodStatus 25 }
```

```
radDmd20RxEthJs2PortStatus OBJECT-TYPE
  SYNTAX      INTEGER {
              down(1),
              unresolved(2),
              halfDuplex10mbs(3),
              halfDuplex100mbs(4),
              fullDuplex10mbs(5),
              fullDuplex100mbs(6),
              portNotUsed(7),
              halfDuplex1000mbs(8),
              fullDuplex1000mbs(9)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "Ethernet bridge JS 2 port status."
  ::= { radDmd20DemodStatus 26 }

radDmd20RxEthJs3PortStatus OBJECT-TYPE
  SYNTAX      INTEGER {
              down(1),
              unresolved(2),
              halfDuplex10mbs(3),
              halfDuplex100mbs(4),
              fullDuplex10mbs(5),
              fullDuplex100mbs(6),
              portNotUsed(7),
              halfDuplex1000mbs(8),
              fullDuplex1000mbs(9)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "Ethernet bridge JS 3 port status."
  ::= { radDmd20DemodStatus 27 }

radDmd20RxEthJs4PortStatus OBJECT-TYPE
  SYNTAX      INTEGER {
              down(1),
              unresolved(2),
              halfDuplex10mbs(3),
              halfDuplex100mbs(4),
              fullDuplex10mbs(5),
              fullDuplex100mbs(6),
              portNotUsed(7),
              halfDuplex1000mbs(8),
              fullDuplex1000mbs(9)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "Ethernet bridge JS 4 port status."
  ::= { radDmd20DemodStatus 28 }

radDmd20RxEthWanStatus OBJECT-TYPE
```

```
    SYNTAX      INTEGER {
                down(1),
                unresolved(2),
                halfDuplex10mbs(3),
                halfDuplex100mbs(4),
                fullDuplex10mbs(5),
                fullDuplex100mbs(6),
                portNotUsed(7),
                halfDuplex1000mbs(8),
                fullDuplex1000mbs(9)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
                "Ethernet bridge WAN Status."
    ::= { radDmd20DemodStatus 29 }

radDmd20RxRawBerStatus OBJECT-TYPE
    SYNTAX      BerStatusStringType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
                "Raw BER status"
    ::= { radDmd20DemodStatus 30 }

radDmd20RxCorrectedBerStatus OBJECT-TYPE
    SYNTAX      BerStatusStringType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
                "Corrected BER status"
    ::= { radDmd20DemodStatus 31 }

radDmd20RxTestPatternBerStatus OBJECT-TYPE
    SYNTAX      BerStatusStringType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
                "Test pattern BER status"
    ::= { radDmd20DemodStatus 32 }

radDmd20RxAupcRemoteBerStatus OBJECT-TYPE
    SYNTAX      BerStatusStringType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
                "AUPC remote BER status"
    ::= { radDmd20DemodStatus 33 }

radDmd20RxCarrierFrequencyOffset OBJECT-TYPE
    SYNTAX      INTEGER (-2147483648..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
                "Carrier frequency offset in Hz."
    ::= { radDmd20DemodStatus 34 }
```

```
radDmd20RxAgcVoltage OBJECT-TYPE
  SYNTAX      INTEGER (0..990)
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
          "Rx Agc Voltage Level in Volts.  There is an implied decimal point.
           A value of 450 corresponds to 4.50V"
  ::= { radDmd20DemodStatus 35 }

-- ---------------------------------------------------------------------------------------------------
-- Dmd20 common non-volatile status information.

radDmd20CommonExternalExcClock OBJECT-TYPE
  SYNTAX      INTEGER (2400..20000000)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the external clock frequency, being provided on the Ext BNC port"
  ::= { radDmd20CommonNVStatus 1 }

radDmd20CommonExternalReference OBJECT-TYPE
  SYNTAX      INTEGER (256000..10000000)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the external frequency reference in Hz. Valid settings are
          from 256 KHz to 10 Mhz in 8 kHz steps."
  ::= { radDmd20CommonNVStatus 2 }

radDmd20CommonFrequencyReferenceSource OBJECT-TYPE
  SYNTAX      INTEGER {
          internal(1),
          external(2),
          highStab(3)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects the frequency reference source."
  ::= { radDmd20CommonNVStatus 3 }

radDmd20CommonAlarms1Mask OBJECT-TYPE
  SYNTAX      BITS {
          minus12VoltAlarm(0),
          plus12VoltAlarm(1),
          plus5VoltAlarm(2),
          bit3Reserved(3),
          bit4Reserved(4),
          bit5Reserved(5),
          ifLoSynthesizerFault(6),
          bit7Reserved(7)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
```

```
            "Alarm mask:
            0 = Mask, 1 = Allow"
    ::= { radDmd20CommonNVStatus 4 }

radDmd20CommonAlarms2Mask OBJECT-TYPE
    SYNTAX      BITS {
            terrFpgaFault(0),
            codecFpgaFault(1),
            codecDeviceFault(2),
            bit3Reserved(3),
            dmdPos1p5VoltAlarm(3),
            bit4Reserved(4),
            modPos1p5VoltAlarm(5),
            pos3p3VoltAlarm(6),
            pos20VoltAlarm(7)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Alarm mask:
            0 = Mask, 1 = Allow"
    ::= { radDmd20CommonNVStatus 5 }

radDmd20CommonCarrierType OBJECT-TYPE
    SYNTAX      INTEGER {
            normal(1),
            cw(2),
            dual(3),
            offset(4),
            posFir(5),
            negFir(6)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the carrier type"
    ::= { radDmd20CommonNVStatus 6 }

radDmd20CommonLoopback OBJECT-TYPE
    SYNTAX      INTEGER {
            none(1),
            terrTx(2),
            terrRx(3),
            terrTxRx(4),
            basebandTx(5),
            basebandRx(6),
            basebandTxRx(7),
            if(8)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the loopback type"
    ::= { radDmd20CommonNVStatus 7 }

radDmd20CommonSerialRemoteControl OBJECT-TYPE
```

```
  SYNTAX      INTEGER {
              computer(1),
              terminal(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects wheather the serial remote control is terminal or computer."
  ::= { radDmd20CommonNVStatus 8 }

radDmd20CommonTerminalBaudRate OBJECT-TYPE
  SYNTAX      INTEGER {
              baud150(1),
              baud300(2),
              baud600(3),
              baud1200(4),
              baud2400(5),
              baud4800(6),
              baud9600(7),
              baud19200(8),
              baud38400(9),
              baud57600(10),
              baud115200(11)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects terminal baud rate. No all software versions support the 150 and 300 Baud
rates"
  ::= { radDmd20CommonNVStatus 9 }

radDmd20CommonTerminalEmulation OBJECT-TYPE
  SYNTAX      INTEGER {
              addsvp(1),
              vt100(2),
              wyse50(3)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Selects terminal emulation."
  ::= { radDmd20CommonNVStatus 10 }

radDmd20CommonRemoteAddress OBJECT-TYPE
  SYNTAX      INTEGER (32..255)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Remote port address, 32 through 255."
  ::= { radDmd20CommonNVStatus 11 }

radDmd20CommonRemoteBaudRate OBJECT-TYPE
  SYNTAX      INTEGER {
              baud150(1),
              baud300(2),
              baud600(3),
```

```
            baud1200(4),
            baud2400(5),
            baud4800(6),
            baud9600(7),
            baud19200(8),
            baud38400(9),
            baud57600(10),
            baud115200(11)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects remote port Baud Rate."
    ::= { radDmd20CommonNVStatus 12 }

radDmd20CommonRemoteInterface OBJECT-TYPE
    SYNTAX      INTEGER {
            rs232(1),
            rs485(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects remote line interface type."
    ::= { radDmd20CommonNVStatus 13 }

radDmd20CommonEventClear  OBJECT-TYPE
    SYNTAX      Unsigned32 (0..4294967295)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Any write to this object clears the event buffer."
    ::= { radDmd20CommonNVStatus 14 }

radDmd20CommonLatchedAlarmsClear  OBJECT-TYPE
    SYNTAX      Unsigned32 (0..4294967295)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Any write to this object clears the latched alarms."
    ::= { radDmd20CommonNVStatus 15 }

radDmd20CommonMinorAlarmRelayUsage OBJECT-TYPE
    SYNTAX      INTEGER {
            ibsPromptAndService(1),
            minorAlarmsAndIbs(2)
            }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the usage of two of the relay contacts on the baseband board.
            When an IBS type Network spec is used this value is ignored and the
            contacts are ibsPromptAndService only.  In closed network configurations
            the relays can be used for ibs prompt and service purposes or both ibs and
            txMinor alarms and rxMinor alarms."
    ::= { radDmd20CommonNVStatus 16 }
```

```
-- ---------------------------------------------------------------------------------------------------
-- Dmd20 common status information.

radDmd20CommonAlarms1 OBJECT-TYPE
  SYNTAX      BITS {
              minus12VoltAlarm(0),
              plus12VoltAlarm(1),
              plus5VoltAlarm(2),
              bit3Reserved(3),
              bit4Reserved(4),
              bit5Reserved(5),
              ifLoSynthesizerFault(6),
              bit7Reserved(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20CommonStatus 1 }

radDmd20CommonAlarms2 OBJECT-TYPE
  SYNTAX      BITS {
              terrFpgaFault(0),
              codecFpgaFault(1),
              codecDeviceFault(2),
              dmdPos1p5VoltAlarm(3),
              bit4Reserved(4),
              modPos1p5VoltAlarm(5),
              pos3p3VoltAlarm(6),
              pos20VoltAlarm(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
              "A bit field.  On startup, the agent initializes this to the value '00000000'B.
              Activity/Lock: 1 = Pass, 0 = Fail
              Alarm/Fault:   0 = Pass, 1 = Fail"
  ::= { radDmd20CommonStatus 2 }

radDmd20CommonLatchedAlarms1 OBJECT-TYPE
  SYNTAX      BITS {
              minus12VoltAlarm(0),
              plus12VoltAlarm(1),
              plus5VoltAlarm(2),
              bit3Reserved(3),
              bit4Reserved(4),
              bit5Reserved(5),
              ifLoSynthesizerFault(6),
              bit7Reserved(7)
              }
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
```

```
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Pass, 1 = Fail"
    ::= { radDmd20CommonStatus 3 }

radDmd20CommonLatchedAlarms2 OBJECT-TYPE
    SYNTAX      BITS {
            terrFpgaFault(0),
            codecFpgaFault(1),
            codecDeviceFault(2),
            dmdPos1p5VoltAlarm (3),
            bit4Reserved(4),
            modPos1p5VoltAlarm(5),
            pos3p3VoltAlarm(6),
            pos20VoltAlarm(7)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A bit field.  On startup, the agent initializes this to the value '00000000'B.
            0 = Pass, 1 = Fail"
    ::= { radDmd20CommonStatus 4 }

radDmd20CommonPos5VDcX10 OBJECT-TYPE
    SYNTAX      RadVoltageLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "+5V voltage. Implied decimal point, 49 means 4.9Volts"
    ::= { radDmd20CommonStatus 5 }

radDmd20CommonPos12VDcX10 OBJECT-TYPE
    SYNTAX      RadVoltageLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "+12V voltage. Implied decimal point, 121 means 12.1Volts"
    ::= { radDmd20CommonStatus 6 }

radDmd20CommonNeg12VDcX10 OBJECT-TYPE
    SYNTAX      RadVoltageLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "-12V voltage. Implied decimal point and sign, 121 means -12.1Volts"
    ::= { radDmd20CommonStatus 7 }

radDmd20CommonFirmwareName OBJECT-TYPE
    SYNTAX      FirmwareNameType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "This is the modem firmware name."
    ::= { radDmd20CommonStatus 8 }

-- ---------------------------------------------------------------------------------------------------
-- Dmd20 Trap definitions.
```

```
-- Include Prefix for compatibility with SNMPv1 traps and procedures
-- employed by multi-lingual and proxy forwarding systems

radDmd20TrapPrefix   OBJECT IDENTIFIER ::= { radDmd20Traps 0 }

radDmd20TxMajorAlarmTrap NOTIFICATION-TYPE
  OBJECTS    {
             radDmd20TxAlarms1
             }
  STATUS     current
  DESCRIPTION "Transmit major alarm trap."
  ::= { radDmd20TrapPrefix 1 }

radDmd20TxMinorAlarmTrap NOTIFICATION-TYPE
  OBJECTS    {
             radDmd20TxAlarms2,
             radDmd20TxDropStatus,
             radDmd20TxBackwardAlarms,
             radDmd20TxAlarms4
             }
  STATUS     current
  DESCRIPTION "Transmit minor alarm trap."
  ::= { radDmd20TrapPrefix 2 }

radDmd20RxMajorAlarmTrap NOTIFICATION-TYPE
  OBJECTS    {
             radDmd20RxAlarms1,
             radDmd20RxAlarms2,
             radDmd20RxAlarms3
             }
  STATUS     current
  DESCRIPTION "Receive major alarm trap."
  ::= { radDmd20TrapPrefix 3 }

radDmd20RxMinorAlarmTrap NOTIFICATION-TYPE
  OBJECTS    {
             radDmd20RxAlarms4,
             radDmd20RxAlarms5,
             radDmd20RxInsertStatus,
             radDmd20RxBackwardAlarms
             }
  STATUS     current
  DESCRIPTION "Receive minor alarm trap."
  ::= { radDmd20TrapPrefix 4 }

radDmd20CommonAlarmTrap NOTIFICATION-TYPE
  OBJECTS    {
             radDmd20CommonAlarms1,
             radDmd20CommonAlarms2
             }
  STATUS     current
  DESCRIPTION "Common alarm trap."
  ::= { radDmd20TrapPrefix 5 }

-- ------------------------------------------------------------------------------------------
```

```
-- DMD20 LBST
-- Dmd20 Mod Lbst nonvolatile status information.

radDmd20LbstTxUplinkFrequencyHz OBJECT-TYPE
  SYNTAX      Counter64
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects RF frequency in Hz steps. 2GHz to 99 GHz."
  ::= { radDmd20ModLbstNVStatus 1 }

radDmd20LbstTxLoFrequencyHz OBJECT-TYPE
  SYNTAX      Counter64
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Selects local oscillator frequency in Hz steps. 2GHz to 99 GHz."
  ::= { radDmd20ModLbstNVStatus 2 }

radDmd20LbstTxSideBand OBJECT-TYPE
  SYNTAX      INTEGER {
          highSide(1),
          lowSide(2)
          }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "Oscillator side band select."
  ::= { radDmd20ModLbstNVStatus 3 }

radDmd20LbstTx10MhzReferenceEnable OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "10 MHz BUC reference enable."
  ::= { radDmd20ModLbstNVStatus 4 }

radDmd20LbstTxVoltageEnable OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "BUC supply voltage enable."
  ::= { radDmd20ModLbstNVStatus 5 }

radDmd20LbstTxVoltageLowerThreshold OBJECT-TYPE
  SYNTAX      RadVoltageLevel
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
          "BUC low voltage alarm threshold. There is an implied decimal point."
  ::= { radDmd20ModLbstNVStatus 6 }

radDmd20LbstTxVoltageUpperThreshold OBJECT-TYPE
  SYNTAX      RadVoltageLevel
```

```
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "BUC Hi voltage alarm threshold. There is an implied decimal point."
    ::= { radDmd20ModLbstNVStatus 7 }

radDmd20LbstTxCurrentLowerThreshold OBJECT-TYPE
    SYNTAX      RadCurrentLevel
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "BUC Low current draw alarm threshold. There is an implied decimal point."
    ::= { radDmd20ModLbstNVStatus 8 }

radDmd20LbstTxCurrentUpperThreshold OBJECT-TYPE
    SYNTAX      RadCurrentLevel
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "BUC Hi current draw alarm threshold. There is an implied decimal point."
    ::= { radDmd20ModLbstNVStatus 9 }

radDmd20FskCommsSelect OBJECT-TYPE
    SYNTAX      INTEGER {
                commsSelectNone(1),
                commsSelectCodan(2),
                commsSelectTerraSat(3),
                commsSelectAmplus(4)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the protocol used on the Fsk port"
    ::= { radDmd20ModLbstNVStatus 10 }

radDmd20FskTestType OBJECT-TYPE
    SYNTAX      INTEGER {
                fskTestTypeNone(1),
                fskTestTypeLoopback(2),
                fskTestTypeCycleTxEnable(3),
                fskTestTypeCodanPassThru(4),
                fskTestTypeTerrasatPassThru(5),
                fskTestTypeAmplusPassThru(6)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Selects the type of Fsk communications test to use"
    ::= { radDmd20ModLbstNVStatus 11 }

radDmd20BucAddress OBJECT-TYPE
    SYNTAX      INTEGER (0..255)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Address used when when Fsk messages are sent to the Buc.  This address
```

```
            is dependent upon the protocol selected.  Some BUCs require specific values"
    ::= { radDmd20ModLbstNVStatus 12 }

radDmd20BucOutputEnable OBJECT-TYPE
    SYNTAX      ControlType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "Using the Fsk interface and active Fsk protocol enable/disables the BUC output"
    ::= { radDmd20ModLbstNVStatus 13 }

-- ------------------------------------------------------------------------------------------------
-- Dmd20 Mod Lbst volatile status information.

radDmd20LbstTxBucVoltageX10 OBJECT-TYPE
    SYNTAX      RadVoltageLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "BUC voltage. Implied decimal point, 482 means 48.2Volts"
    ::= { radDmd20ModLbstStatus 1 }

radDmd20LbstTxBucCurrentX1000 OBJECT-TYPE
    SYNTAX      RadCurrentLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "BUC current. Implied decimal point, 5500 means 5.500Amps"
    ::= { radDmd20ModLbstStatus 2 }


radDmd20FskTestResultAlarm OBJECT-TYPE
    SYNTAX      INTEGER {
            testPass(1),
            testFail(2)
            }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Status of the last Fsk Test"
    ::= { radDmd20ModLbstStatus 3 }

radDmd20BucCarrierLeveldBmX100 OBJECT-TYPE
    SYNTAX      RadTransmitPowerLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The Tx power level of the BUC in dBm. There is an implied decimal point.
            For example, a value of -100 represents a transmit power level
            of -10.0 dBm."
    ::= { radDmd20ModLbstStatus 4 }

radDmd20BucSummaryStatus OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
```

```
  DESCRIPTION
        "Summary Status value provided by the BUC across the Fsk interface"
  ::= { radDmd20ModLbstStatus 5 }

radDmd20BucTemperature OBJECT-TYPE
  SYNTAX     RadTemperature
  MAX-ACCESS  read-only
  STATUS     current
  DESCRIPTION
        "Temperature, in degrees C, as reported by the BUC across the Fsk interface.
        There is an implied decimal point.
        For example, a value of 300 represents a temperature of 30.0 C"
  ::= { radDmd20ModLbstStatus 6 }

radDmd20FskPassThruCmd OBJECT-TYPE
  SYNTAX     FskPassThruCmdType
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
        "Command text to be passed to Fsk interface"
  ::= { radDmd20ModLbstStatus 7 }

radDmd20FskExecutePassThruCmd OBJECT-TYPE
  SYNTAX     Unsigned32 (0..4294967295)
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
        "Any write to this object will force the value of the FskPassThruCmd
        to be written out the fsk interface"
  ::= { radDmd20ModLbstStatus 8 }

radDmd20FskPassThruReply OBJECT-TYPE
  SYNTAX     FskPassThruReplyType
  MAX-ACCESS  read-only
  STATUS     current
  DESCRIPTION
        "Fsk interface's most recent reply to previous Fsk pass thru command"
  ::= { radDmd20ModLbstStatus 9 }

-- ------------------------------------------------------------------------------------------------
-- Dmd20 Demod Lbst nonvolatile status information.

radDmd20LbstRxDownlinkFrequencyHz OBJECT-TYPE
  SYNTAX     Counter64
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
        "Selects RF frequency in Hz steps. 2GHz to 99 GHz."
  ::= { radDmd20DemodLbstNVStatus 1 }

radDmd20LbstRxLoFrequencyHz OBJECT-TYPE
  SYNTAX     Counter64
  MAX-ACCESS  read-write
  STATUS     current
  DESCRIPTION
        "Selects local oscillator frequency in Hz steps. 2GHz to 99 GHz."
```

```
  ::= { radDmd20DemodLbstNVStatus 2 }

radDmd20LbstRxSideBand OBJECT-TYPE
  SYNTAX      INTEGER {
              highSide(1),
              lowSide(2)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "Oscillator side band select."
  ::= { radDmd20DemodLbstNVStatus 3 }

radDmd20LbstRx10MhzReferenceEnable OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "10 MHz LNB reference enable."
  ::= { radDmd20DemodLbstNVStatus 4 }

radDmd20LbstRxVoltageEnable OBJECT-TYPE
  SYNTAX      ControlType
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "LNB supply voltage enable."
  ::= { radDmd20DemodLbstNVStatus 5 }

radDmd20LbstRxVoltageSelect OBJECT-TYPE
  SYNTAX      INTEGER {
              select13Volts(1),
              select15Volts(2),
              select18Volts(3),
              select20Volts(4)
              }
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "LNB supply voltage. Valid settings are 13, 15, 18, and 20 volts."
  ::= { radDmd20DemodLbstNVStatus 6 }

radDmd20LbstRxVoltageLowerThreshold OBJECT-TYPE
  SYNTAX      RadVoltageLevel
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "LNB low voltage alarm threshold. There is an implied decimal point."
  ::= { radDmd20DemodLbstNVStatus 7 }

radDmd20LbstRxVoltageUpperThreshold OBJECT-TYPE
  SYNTAX      RadVoltageLevel
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
              "LNB Hi voltage alarm threshold. There is an implied decimal point."
```

```
    ::= { radDmd20DemodLbstNVStatus 8 }

radDmd20LbstRxCurrentLowerThreshold OBJECT-TYPE
    SYNTAX      RadCurrentLevel
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "LNB Low current draw alarm threshold. There is an implied decimal point."
    ::= { radDmd20DemodLbstNVStatus 9 }

radDmd20LbstRxCurrentUpperThreshold OBJECT-TYPE
    SYNTAX      RadCurrentLevel
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "LNB Hi current draw alarm threshold. There is an implied decimal point."
    ::= { radDmd20DemodLbstNVStatus 10 }

-- ---------------------------------------------------------------------------------------------
-- Dmd20 Demod Lbst volatile status information.

radDmd20LbstRxLnbVoltageX10 OBJECT-TYPE
    SYNTAX      RadVoltageLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "LNB voltage. Implied decimal point, 181 means 18.1Volts"
    ::= { radDmd20DemodLbstStatus 1 }

radDmd20LbstRxLnbCurrentX1000 OBJECT-TYPE
    SYNTAX      RadCurrentLevel
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "LNB current. Implied decimal point, 498 means 0.498Amps"
    ::= { radDmd20DemodLbstStatus 2 }

-- ---------------------------------------------------------------------------------------------
-- DMD20 MIB conformance

radDmd20ModNVStatusGroup OBJECT-GROUP
    OBJECTS  {
            radDmd20TxCarrierControl,
            radDmd20TxNetworkSpec,
            radDmd20TxCarrierLeveldBmX100,
            radDmd20TxCarrierFrequencyHz,
            radDmd20TxTerrDataRateHz,
            radDmd20TxStrapCode,
            radDmd20TxInnerFecRate,
            radDmd20TxModulationType,
            radDmd20TxSatFraming,
            radDmd20TxOuterFecEnable,
            radDmd20TxOuterFecRate,
            radDmd20TxInterleaverDepth,
            radDmd20TxDropMode,
            radDmd20TxDropMap,
```

```
            radDmd20TxClockSource,
            radDmd20TxClockPolarity,
            radDmd20TxSctClockSource,
            radDmd20TxDataPolarity,
            radDmd20TxSpectrum,
            radDmd20TxScramblingEnable,
            radDmd20TxScramblingType,
            radDmd20TxDifferentialEncoder,
            radDmd20TxBpskSymbolPairingSwap,
            radDmd20TxEscOverheadType,
            radDmd20TxEsc1GaindBX100,
            radDmd20TxEsc2GaindBX100,
            radDmd20TxTerrInterfaceType,
            radDmd20TxAupcLocalMode,
            radDmd20TxAupcRemoteMode,
            radDmd20TxAupcLocalCarrierLossAction,
            radDmd20TxAupcRemoteCarrierLossAction,
            radDmd20TxAupcTrackingRate,
            radDmd20TxAupcRemoteBasebandLoopback,
            radDmd20TxAupcRemoteTestPattern,
            radDmd20TxAupcTargetEbnoDbX100,
            radDmd20TxAupcMinCarrierLeveldBmX100,
            radDmd20TxAupcMaxCarrierLeveldBmX100,
            radDmd20TxAupcNomCarrierLeveldBmX100,
            radDmd20TxTestPattern,
            radDmd20TxCircuitName,
            radDmd20TxAlarms1Mask,
            radDmd20TxAlarms2Mask,
            radDmd20TxForcedAlarms,
            radDmd20TxDropStatusMask,
            radDmd20TxTerrestrialFraming,
            radDmd20TxSpectralMask,
            radDmd20TxAlarms4Mask,
            radDmd20TxEthFlowControl,
            radDmd20TxEthDaisyChain,
            radDmd20TxRsOfecRate,
            radDmd20TxIfecInterleaver,
            radDmd20TxEsEnhancedEnable,
            radDmd20TxEsSerialControlInterface,
            radDmd20TxEsBaudRate,
            radDmd20TxEsBitsPerChar,
            radDmd20TxCarrierDelaySec,
            radDmd20TxSccCtlRatio,
            radDmd20TxSccInbandRate,
            radDmd20TxSctClockPolarity,
            radDmd20TxCompensation,
            radDmd20TxForceAlarmTest,
            radDmd20TxAsyncInbandRate,
            radDmd20TxEthQosType,
            radDmd20TxEthQosQue
            }
    STATUS      current
    DESCRIPTION "Modulator non-volatile status group."
::= { radDmd20Groups 1 }

radDmd20ModStatusGroup OBJECT-GROUP
```

```
    OBJECTS  {
            radDmd20TxAlarms1,
            radDmd20TxAlarms2,
            radDmd20TxDropStatus,
            radDmd20TxBackwardAlarms,
            radDmd20TxLatchedAlarms1,
            radDmd20TxLatchedAlarms2,
            radDmd20TxSymbolRateHz,
            radDmd20TxAlarms4,
            radDmd20TxLatchedAlarms4
            }
    STATUS      current
    DESCRIPTION "Modulator volatile status group."
::= { radDmd20Groups 2 }

radDmd20DemodNVStatusGroup OBJECT-GROUP
    OBJECTS  {
            radDmd20RxNetworkSpec,
            radDmd20RxCarrierFrequencyHz,
            radDmd20RxTerrDataRateHz,
            radDmd20RxStrapCode,
            radDmd20RxInnerFecRate,
            radDmd20RxModulationType,
            radDmd20RxSatFraming,
            radDmd20RxOuterFecEnable,
            radDmd20RxOuterFecRate,
            radDmd20RxInterleaverDepth,
            radDmd20RxInsertMode,
            radDmd20RxInsertMap,
            radDmd20RxBufferClockSource,
            radDmd20RxBufferClockPolarity,
            radDmd20RxBufferSize,
            radDmd20RxDataPolarity,
            radDmd20RxSpectrum,
            radDmd20RxDescramblingEnable,
            radDmd20RxDescramblingType,
            radDmd20RxDifferentialDecoder,
            radDmd20RxBpskSymbolPairingSwap,
            radDmd20RxT1E1FrameSource,
            radDmd20RxExtClockSource,
            radDmd20RxCarrierSweepRange,
            radDmd20RxCarrierLevelLimitdBmX100,
            radDmd20RxEscOverheadType,
            radDmd20RxEsc1GaindBX100,
            radDmd20RxEsc2GaindBX100,
            radDmd20RxTerrInterfaceType,
            radDmd20RxEsEnhancedEnable,
            radDmd20RxEsSerialControlInterface,
            radDmd20RxEsBaudRate,
            radDmd20RxEsBitsPerChar,
            radDmd20RxTestPattern,
            radDmd20RxCircuitName,
            radDmd20RxForcedAlarms,
            radDmd20RxAlarms1Mask,
            radDmd20RxAlarms2Mask,
            radDmd20RxAlarms3Mask,
```

```
            radDmd20RxAlarms4Mask,
            radDmd20RxAlarms5Mask,
            radDmd20RxInsertStatusMask,
            radDmd20RxTerrestrialFraming,
            radDmd20RxTerrestrialStreaming,
            radDmd20RxAlarms6Mask,
            radDmd20RxCarrierReacqRange,
            radDmd20RxRsOfecRate,
            radDmd20RxIfecInterleaver,
            radDmd20RxCarrierSweepDelay,
            radDmd20RxEbnoAlarmThreshold,
            radDmd20RxBufferReset,
            radDmd20RxRestartTestPattern,
            radDmd20RxSccCtlRatio,
            radDmd20RxSccInbandRate,
            radDmd20RxFastAcquisition,
            radDmd20RxSpectralMask,
            radDmd20RxAdjacentCarrierType,
            radDmd20RxForceAlarmTest,
            radDmd20NumRxBufferClockSources,
            radDmd20RxBufferClockSource1,
            radDmd20RxBufferClockSource2,
            radDmd20RxBufferClockSource3,
            radDmd20RxBufferClockSource4,
            radDmd20RxBufferClockSource5,
            radDmd20RxAsyncInbandRate,
            radDmd20RxRotationAmbiguity,        radDmd20RxRfmTimeConstant
            }
  STATUS     current
  DESCRIPTION "Demodulator non-volatile status group."
::= { radDmd20Groups 3 }

radDmd20DemodStatusGroup OBJECT-GROUP
  OBJECTS  {
            radDmd20RxAlarms1,
            radDmd20RxAlarms2,
            radDmd20RxAlarms3,
            radDmd20RxAlarms4,
            radDmd20RxAlarms5,
            radDmd20RxInsertStatus,
            radDmd20RxBackwardAlarms,
            radDmd20RxLatchedAlarms1,
            radDmd20RxLatchedAlarms2,
            radDmd20RxLatchedAlarms3,
            radDmd20RxLatchedAlarms4,
            radDmd20RxLatchedAlarms5,
            radDmd20RxBerEbnoStatus,
            radDmd20RxEbno,
            radDmd20RxBufferLevel,
            radDmd20RxCarrierLeveldBmX100,
            radDmd20RxBitErrorCount,
            radDmd20RxTestPatternErrorCount,
            radDmd20RxLossOfTerrInputSignal,
            radDmd20RxSymbolRateHz,
            radDmd20RxAlarms6,
            radDmd20RxLatchedAlarms6,
```

```
            radDmd20RxEthPktErrorCount,
            radDmd20RxEthPktTotalCount,
            radDmd20RxEthJs1PortStatus,
            radDmd20RxEthJs2PortStatus,
            radDmd20RxEthJs3PortStatus,
            radDmd20RxEthJs4PortStatus,
            radDmd20RxEthWanStatus,
            radDmd20RxRawBerStatus,
            radDmd20RxCorrectedBerStatus,
            radDmd20RxTestPatternBerStatus,
            radDmd20RxAupcRemoteBerStatus,
            radDmd20RxCarrierFrequencyOffset,
            radDmd20RxAgcVoltage
            }
    STATUS      current
    DESCRIPTION "Demodulator volatile status group."
::= { radDmd20Groups 4 }

radDmd20CommonNVStatusGroup OBJECT-GROUP
    OBJECTS  {
            radDmd20CommonExternalExcClock,
            radDmd20CommonExternalReference,
            radDmd20CommonFrequencyReferenceSource,
            radDmd20CommonAlarms1Mask,
            radDmd20CommonAlarms2Mask,
            radDmd20CommonCarrierType,
            radDmd20CommonLoopback,
            radDmd20CommonSerialRemoteControl,
            radDmd20CommonTerminalBaudRate,
            radDmd20CommonTerminalEmulation,
            radDmd20CommonRemoteAddress,
            radDmd20CommonRemoteBaudRate,
            radDmd20CommonRemoteInterface,
            radDmd20CommonEventClear,
            radDmd20CommonLatchedAlarmsClear,
            radDmd20CommonMinorAlarmRelayUsage
            }
    STATUS      current
    DESCRIPTION "Common non-volatile status group."
    ::= { radDmd20Groups 5 }

radDmd20CommonStatusGroup OBJECT-GROUP
    OBJECTS  {
            radDmd20CommonAlarms1,
            radDmd20CommonAlarms2,
            radDmd20CommonLatchedAlarms1,
            radDmd20CommonLatchedAlarms2,
            radDmd20CommonPos5VDcX10,
            radDmd20CommonPos12VDcX10,
            radDmd20CommonNeg12VDcX10,
            radDmd20CommonFirmwareName
            }
    STATUS      current
    DESCRIPTION "Common volatile status group."
    ::= { radDmd20Groups 6 }
```

```
radDmd20NotificationsGroup NOTIFICATION-GROUP
  NOTIFICATIONS
          {
          radDmd20TxMajorAlarmTrap,
          radDmd20TxMinorAlarmTrap,
          radDmd20RxMajorAlarmTrap,
          radDmd20RxMinorAlarmTrap,
          radDmd20CommonAlarmTrap
          }
  STATUS      current
  DESCRIPTION
          "Cold start trap and authentication failure trap are the two notifications
          which an SNMPv2 entity is required to implement. Major, minor, and common
          alarm traps are product specific."
  ::= { radDmd20Groups 7 }

-- ---------------------------------------------------------------------------------------------------
radDmd20ModLbstNVStatusGroup OBJECT-GROUP
  OBJECTS  {
          radDmd20LbstTxUplinkFrequencyHz,
          radDmd20LbstTxLoFrequencyHz,
          radDmd20LbstTxSideBand,
          radDmd20LbstTx10MhzReferenceEnable,
          radDmd20LbstTxVoltageEnable,
          radDmd20LbstTxVoltageLowerThreshold,
          radDmd20LbstTxVoltageUpperThreshold,
          radDmd20LbstTxCurrentLowerThreshold,
          radDmd20LbstTxCurrentUpperThreshold,
          radDmd20FskCommsSelect,
          radDmd20FskTestType,
          radDmd20BucAddress,
          radDmd20BucOutputEnable
          }
  STATUS      current
  DESCRIPTION
          "Mod Lbst nonvolatile status group."
  ::= { radDmd20Groups 8 }

radDmd20ModLbstStatusGroup OBJECT-GROUP
  OBJECTS  {
          radDmd20LbstTxBucVoltageX10,
          radDmd20LbstTxBucCurrentX1000,
          radDmd20FskTestResultAlarm,
          radDmd20BucCarrierLeveldBmX100,
          radDmd20BucSummaryStatus,
          radDmd20BucTemperature,
          radDmd20FskPassThruCmd,
          radDmd20FskExecutePassThruCmd,
          radDmd20FskPassThruReply
          }
  STATUS      current
  DESCRIPTION
          "Mod Lbst volatile status group."
  ::= { radDmd20Groups 9 }

radDmd20DemodLbstNVStatusGroup OBJECT-GROUP
```

```
  OBJECTS  {
          radDmd20LbstRxDownlinkFrequencyHz,
          radDmd20LbstRxLoFrequencyHz,
          radDmd20LbstRxSideBand,
          radDmd20LbstRx10MhzReferenceEnable,
          radDmd20LbstRxVoltageEnable,
          radDmd20LbstRxVoltageSelect,
          radDmd20LbstRxVoltageLowerThreshold,
          radDmd20LbstRxVoltageUpperThreshold,
          radDmd20LbstRxCurrentLowerThreshold,
          radDmd20LbstRxCurrentUpperThreshold
          }
  STATUS     current
  DESCRIPTION
          "Demod Lbst nonvolatile status group."
  ::= { radDmd20Groups 10 }

radDmd20DemodLbstStatusGroup OBJECT-GROUP
  OBJECTS  {
          radDmd20LbstRxLnbVoltageX10,
          radDmd20LbstRxLnbCurrentX1000
          }
  STATUS     current
  DESCRIPTION
          "Demod Lbst volatile status group."
  ::= { radDmd20Groups 11 }

END
```

Notes:

Chapter 3. Web Browser

3.1 Web Browser User Interfaces

The Web Browser user interface is available on the DMD20, DMD20LBST, DMD50, DMD2050 and OM20. The Web Browser interface can be accessed through the RJ45, SNMP port located on the unit. Instructions on how to configure the interface for this application can be accessed from the product manual. This section is primarily designed to illustrate all the menus associated with the Web Browser and will not give full descriptions or details of these features. Full feature descriptions can be accessed from the product manual.

Setup and configuration of the Web Browser interface can be accessed in the following product manuals:

Equipment:	**Manual:**
DMD20	MN-DMD20
DMD50	MN-DMD50
DMD2050	MN-DMD2050
OM20	MN-OM20

The Web Browser menus for the DMD20, DMD20LBST, DMD50, DMD2050, DMD1050 and OM20 can only be accessed utilizing Microsoft Internet Explorer 6 or greater.

The DMD20LBST and OM20 supports features for BUC and LNB operations. These products will have additional menus supporting BUC and LNB menus that are not available on the DMD20, DMD50 and the DMD2050.

3.2 Configuring Your PC

An example of the GUI layout is shown in Figure 3-1, showing the location and labeling of the Interface. The graphical user interface is designed to replicate the front panel. For users familiar with the front panel interface adjusting to the GUI interface should be seamless. The GUI Interface is divided into four functional areas: the Front Panel Display simulation, Gel-tab area, information/data entry and product information and contact area.

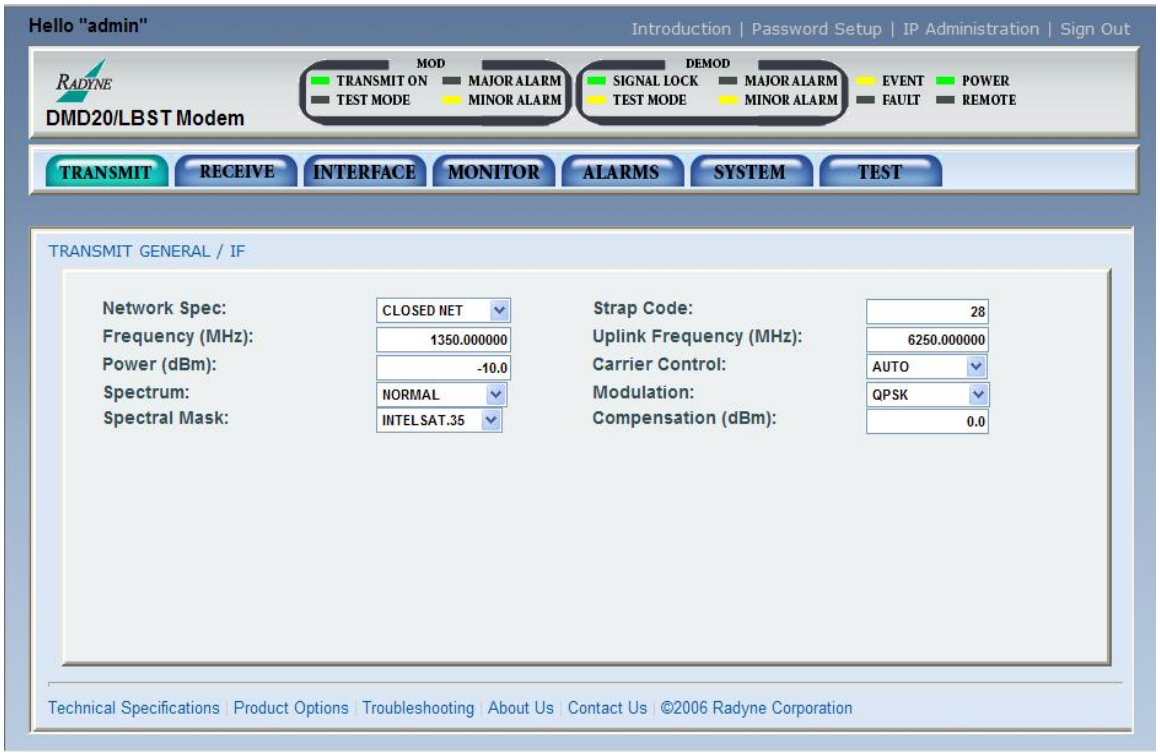


Figure 3-1 Web User Interface

Table 3-1		
Item Number	**Description**	**Function**
1	Product Name	This describes what product is that the interface is connected to.
2	Product Name/Location	This can be used by the user to identify the unit.
3	Alarm and Monitor	Displays fault status and performance monitoring of unit.
4	Gel-Tab Area	This area allows access to data and control input of unit. Moving the cursor across the Gel-Tabs drop down menus appear and allow editing of the data entry area.
5	Data Entry Area	Parameter editing is done in this area.

6	Product Information Contact Information	Access to technical trouble-shooting, product options and specifications is accomplished by selecting one and clicking on that function. Contacting Radyne via Email is possible by clicking on “Contact Us”.

3.2.1 LED Indicators

Twelve LEDs on the GUI Interface (Refer to Table 3-2) indicate the status of the modems operation. The LED colors maintain a consistent meaning. Green is appropriate for normal operation, Yellow means that there is a condition not proper for normal operation, and Red indicates a fault condition that will result in lost communications.

Table 3-2

LED	Color	Function
Modem LED Indicators		
Power	Green	Indicates that the unit is turned on.
Fault	Red	Indicates a hardware fault for the unit.
Event	Yellow	Indicates that a condition or event has occurred that the modem has stored in memory. The events may be viewed from the GUI or in the Terminal Mode.
Remote	Green	Indicates that the unit is in the process of updating firmware with FTP.
Modulator LED Indicators		
Transmit On	Green	Indicates that the Modulator transmitter is on.
Major Alarm	Red	Indicates that the Transmit Direction has failed, losing traffic.
Minor Alarm	Yellow	Indicates that a Transmit Warning Condition exists.
Test Mode	Yellow	Indicates that the transmitter is involved in a current Test Mode activity.
Demodulator LED Indicators		
Signal Lock	Green	Indicates that the receiver locked to an incoming carrier and data, including FEC Sync.
Major Alarm	Red	Indicates that the Receive Direction has failed, losing traffic.
Minor Alarm	Yellow	Indicates that a Receive Warning Condition exists.
Test Mode	Yellow	Indicates that the receiver is involved in a current Test Mode activity.

3.3 GUI Screen Menus

There are four main menus displayed on the Introduction screen upon startup of the web browser. This screen will give a brief overview of the product and contains no configurable items. The four main menu's and with submenus are:

- **Introduction**

- **Password Setup**
  - Access
  - Preferences

- **IP Administration**
  - Modem Addressing
  - Configure Apps
  - Configure PC

- **Monitor and Control**
  - Transmit
  - Receive
  - Interface
  - Monitor
  - Alarms
  - System
  - Test

3.3.1 Introduction Menu

This menu will first appear when starting up the web browser. This page lists the general features of the unit, and lists a brief description of the unit. Notice on the bottom of the page that there are selections for technical Specifications, Product Options, Troubleshooting, About Us, and Contact us. Access these areas for further detailed description of the selection.

Figure 3-2 Introduction Screen

3.3.1.1 Login Screen

Upon initially accessing either the Setup, Monitor & Control, or Administration configuration menu tabs a login prompt will appear. In order to gain access to any of the configuration menus, log in with the correct user name and password. (The factory default login name is “admin” and the default password is “admin”). For further information on setting user profiles see Section 3.3.3 IP and Application Administration.

Figure 3-3 Login Screen

3.3.2 Password Setup

The Password Access Menu allows for multiple operators to be allowed access to the system. User access priorities can be set be completing the fields in the Access menu below.

Access Menu

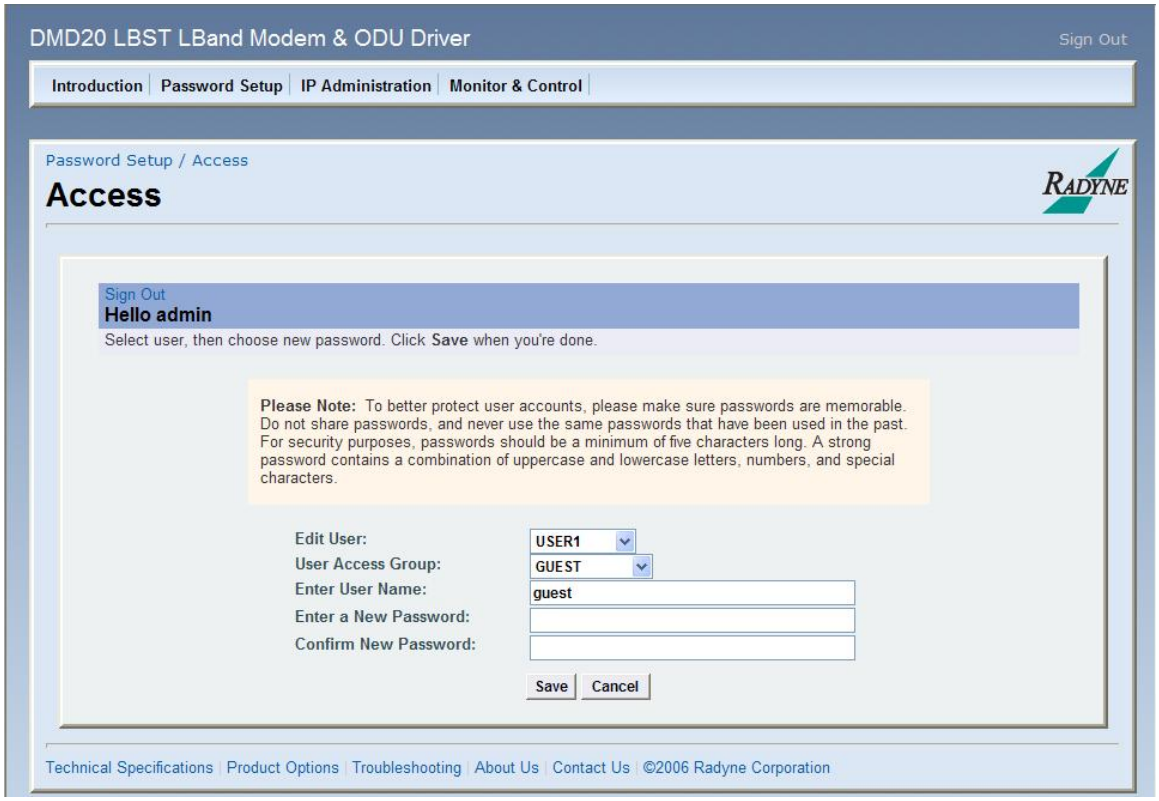


Figure 3-4 Access Menu

Edit User — **{USER 1, USER 2, USER 3}**
Allows the operator to assign the applicable user group.

User Access Group — **{Guest, Operator, Admin}**
Allows the operator to assign the applicable user Access Level group.

Enter User Name — Allows the operator to assign the applicable user name used for login.

Enter a New Password — Allows the operator to assign the applicable user name password used for login.

Confirm New Password — Allows the operator to confirm the applicable user password (this must exactly match the previously entered Password entry for the system to accept).

Preferences Menu

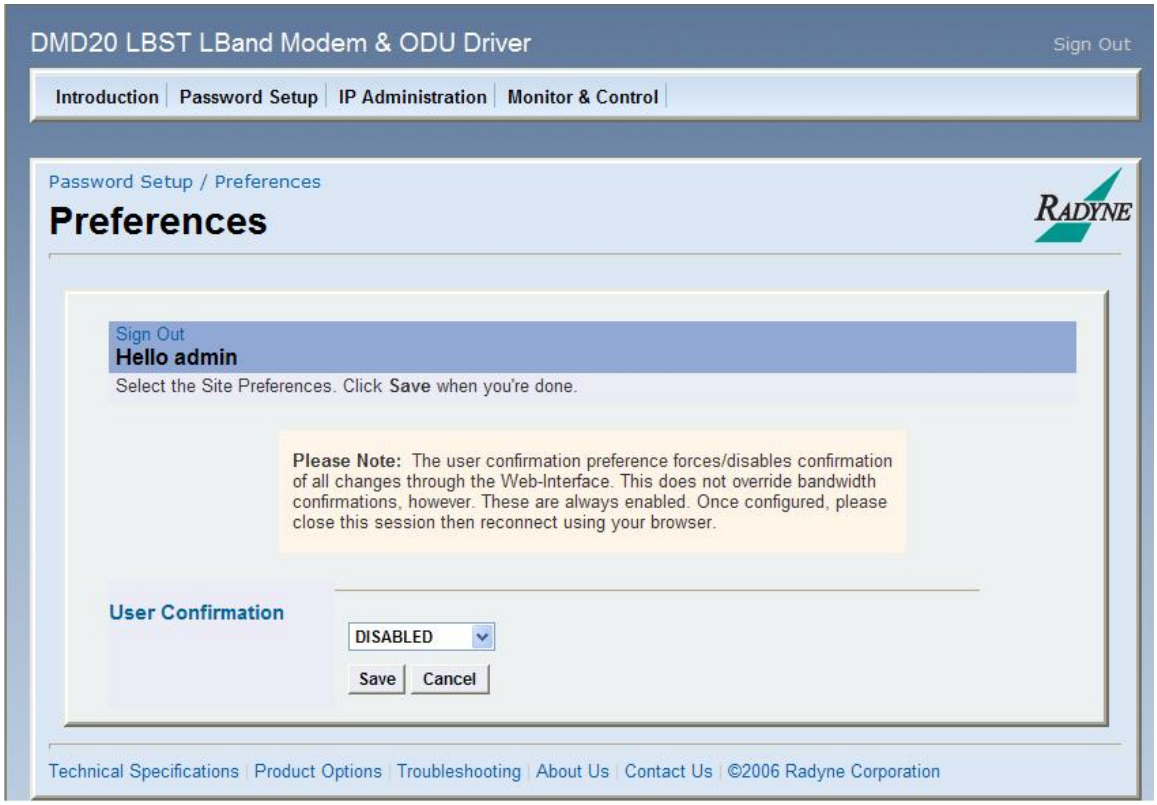


Figure 3-5 Modem Preferences Menu

User Confirmation: **{DISABLED, ENABLED}**
The user information preference allows the user to force/disable confirmation of all changes through the web interface. This does not override bandwidth confirmations. However, these are always enabled.

3.3.3 IP and Application Administration

The IP and Application menu provides instructions on how to configure the modem, applications and PC.

Modem Addressing

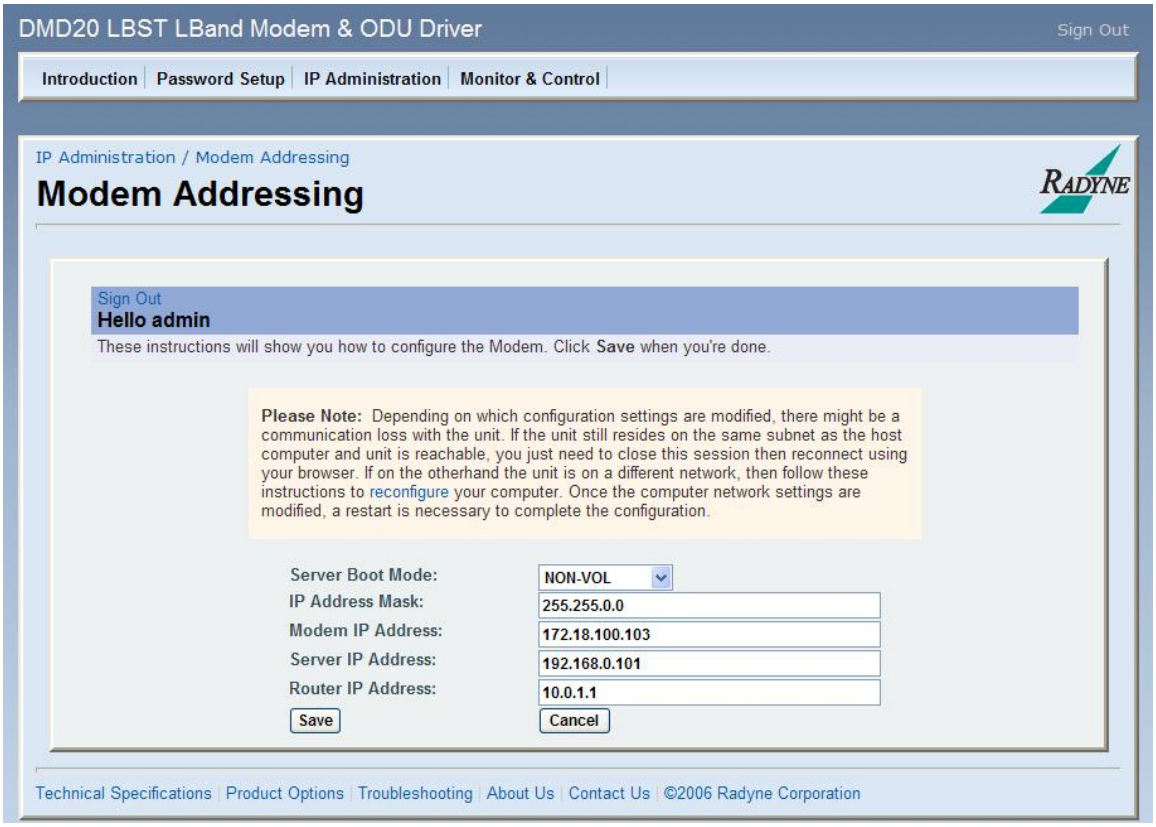


Figure 3-6 Modem Addressing

Server Boot Mode: **{DEFAULT, NON-VOL, BOOTP, IP TEST}**

Default: All of the following parameters as shown in Table 3-3 through 3-7 will be set and will not change until the boot mode is changed.

IP

IPMASK:	255.000.000.000
MODEM IPADDR:	010.000.000.001
SERVER IP ADDR:	010.001.001.001
ROUTER IP ADDR:	010.000.001.001

Table 3-3 IP Parameters

SNMP

SNMP VERSION: V1 & V2			
TRAP VERSION: V1			
AUTHORIZATION: TRAPS OFF			
RD COMMUNITY: PUBLIC			
RDWR COMMUNITY: PUBLIC			
USER 1 Viewer-md5	USER 2 Viewer-sha	USER 3 Oper-md5	USER 4 Oper-sha
ACCESS GROUP VIEWER	ACCESS GROUP VIEWER	ACCESS GROUP OPER	ACCESS GROUP OPER
AUTH PASSWORD Viewer	AUTH PASSWORD Viewer	AUTH PASSWORD Oper	AUTH PASSWORD Oper
PRIV PASSWORD Viewer	PRIV PASSWORD Viewer	PRIV PASSWORD Oper	PRIV PASSWORD Oper
AUTHENTICATION MD5	AUTHENTICATION SHA	AUTHENTICATION MD5	AUTHENTICATION SHA
PRIVACY DES	PRIVACY DES	PRIVACY DES	PRIVACY DES

Table 3-4 SNMP Parameters

FTP

USER ID:	USER
PASSWORD:	PASSWORD

Table 3-5 FTP Parameters

WEB

Confirmation: disabled		
USER 1 GUEST	USER 2 OPER	USER 3 ADMIN
ACCESS GROUP GUEST	ACCESS GROUP OPER	ACCESS GROUP ADMIN
AUTH PASSWORD GUEST	AUTH PASSWORD OPER	AUTH PASSWORD ADMIN

Table 3-6 Web Parameters

TERMINAL AND REMOTE PORT

Type	VT100
baud rate	19200
interface	rs232
remote control	terminal

Table 3-7 Terminal and Remote Port Parameters

NON-VOL: Stores and uses IP Mask and addresses as provided by the user.

BOOTP: At boot time, use Bootp Protocol to get names, masks, and IP Addresses of the modem, router, and server.

IP TEST: The IP Test boot mode has a similar behavior to the default boot mode. The Terminal, IP, SNMP, FTP and Web parameters changed by the default setting will also be reset by the IP Test boot mode. However, instead of the IP addresses being set to an unreadable address, it will be set as follows as shown in Table 3-8:

IP TEST

IP ADDRESS MASK:	255.255.255.0
MODEM IP ADDRESS:	192.168.000.238
SERVER IP ADDRESS	192.168.000.101
ROUTER IP ADDRESS:	192.168.000.102

Table 3-8 IP Test

IP Address Mask: **{XXX.XXX.XXX.XXX}**
The IP Address Mask of the local network. The mask is expressed in a decimal format, and must be a valid TCP/IP Mask. This field should be set before changes are made to the Modem or Router Address.

Modem IP Address: **{XXX.XXX.XXX.XXX}**
The IP Address of the modem. This address should be consistent for the mask defined. This address is expressed in decimal format. Broadcast and loop back addresses will not be allowed. These are addresses with all subnet bits set to 0's or 1's.

Server IP Address: **{XXX.XXX.XXX.XXX}**
The IP Address of the Boot Server and the address of the SNMP Trap Server when SNMP is active. If a server is used and there is no local router, this address must be consistent with the modem address. If a router has been specified, the address is presumed to be reachable via the router. Broadcast and loop back addresses will not be allowed. These are addresses with all subnet bits set to 0's or 1's.

Router IP Address: **{XXX.XXX.XXX.XXX}**
The IP Address of the Local Network Router. If a router is present on the local network, this address must be consistent with the IP Mask and the subnet of the modem. If no router is present, then the address should be set to a foreign address. This address is expressed in decimal format. Broadcast and loop back addresses will not be allowed. These are addresses with all subnet bits set to 0's or 1's.

Configuring Applications

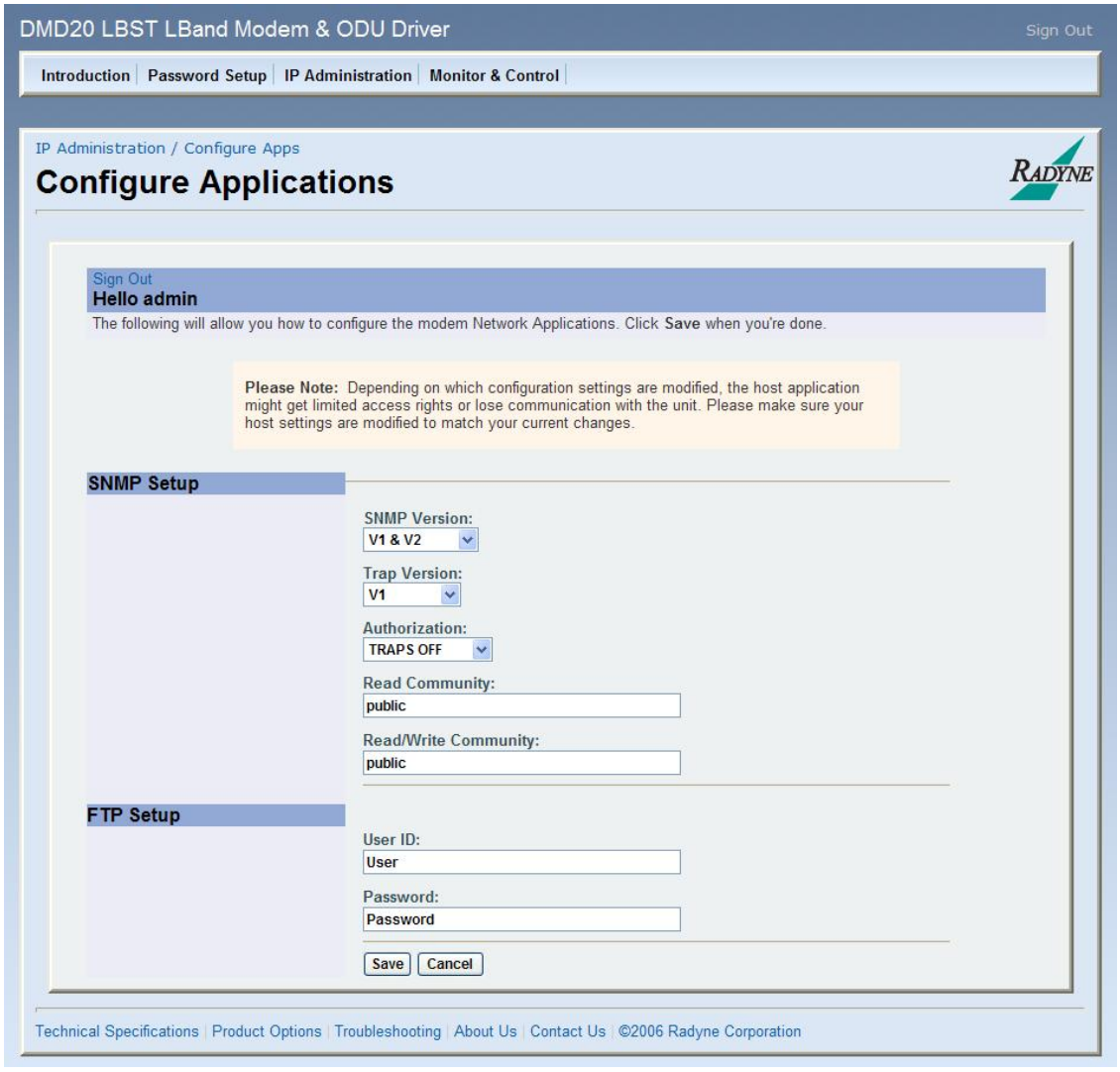


Figure 3-7 Configuring Applications

SNMP Setup:

SNMP Version: **{V1 & 2, V3} Default = V1 & V2**

Trap Version: **{V1 & 2} Default = V1**

Authorization: **{TRAPS ON, TRAPS OFF} Default = TRAPS OFF**

Read Community: **{Public} Default**

Read/Write Community: **{Public} Default**

FTP Setup:

UserID: **User**

Password: **Password**

Configuring The PC

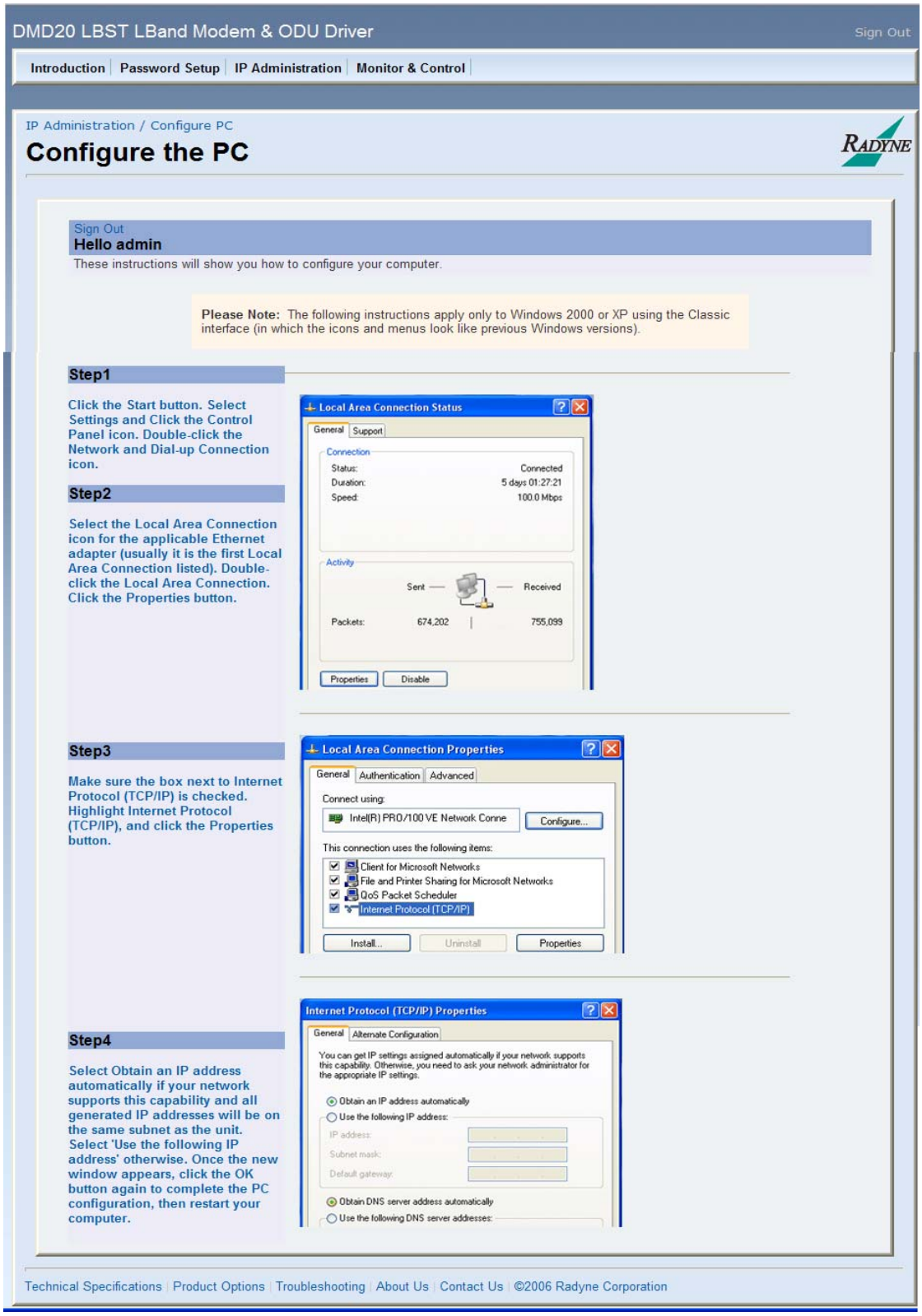


Figure 3-8 Configuring the PC

3.3.4 Monitor and Control Menu

Under this menu, all modem functions that are monitored and/or controlled are accessible. To access the M&C sub menu options drag the cursor across the gel-tabs. Note that as the cursor passes over a tab it is highlighted and a menu drops below the tab. Stop on the desired tab move the cursor down and then across to the desired function. Select the desired sub menu function and the data entry menu will appear in the data entry section allowing for adjustments to the parameters displayed.

3.3.4.1 Transmit Menus

The Transmit menu contains sub menus; General/IF, Data, Reed Solomon, ODU-BUC and AUPC.

Transmit General / IF Menu

Figure 3-9 Transmit General / IF Menu

NOTE

The Uplink Frequency (MHz) menu is only available with the DMD20LBST and the OM20

Transmit / Data Menu

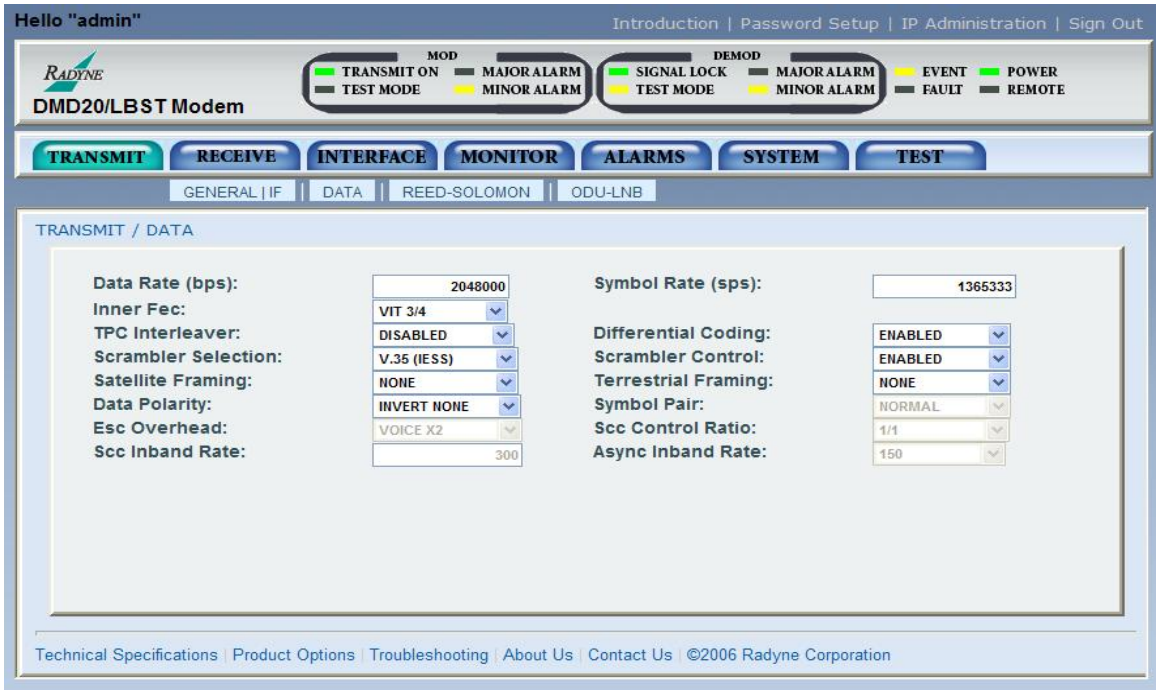


Figure 3-10 Transmit / Data Menu

Transmit / Reed-Solomon Menu

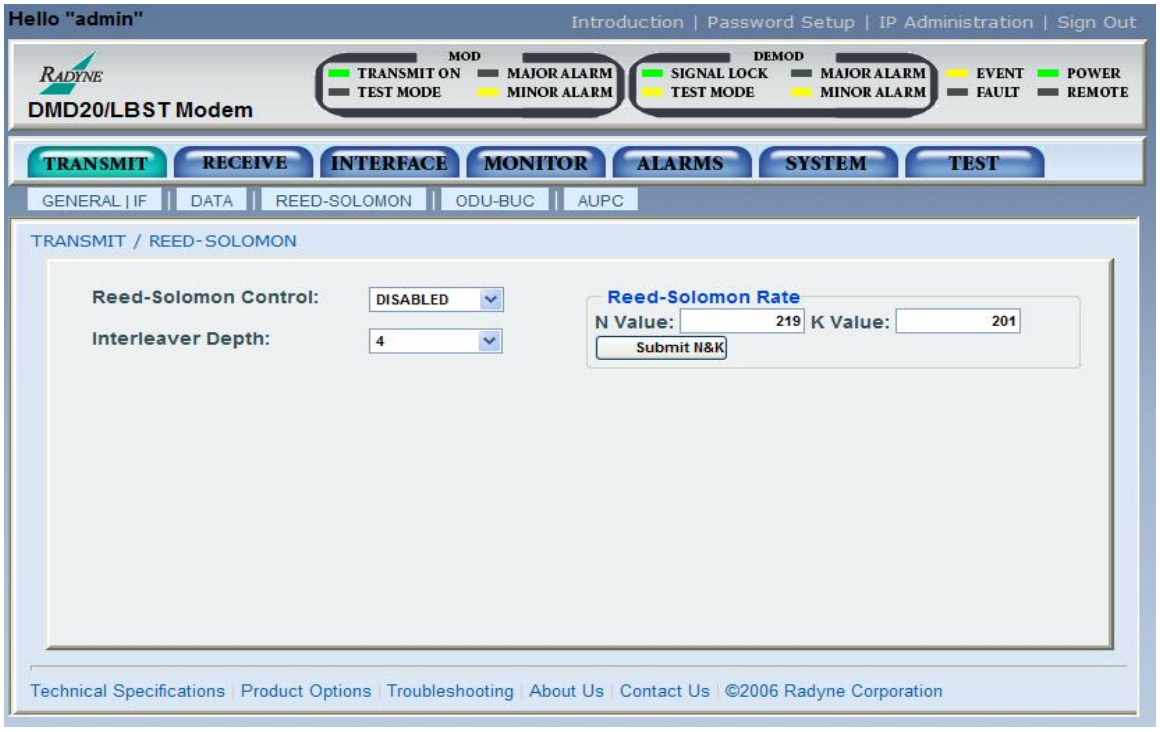


Figure 3-11 Transmit / Reed-Solomon Menu

Transmit / ODU-BUC Menu

Figure 3-12 Transmit / ODU-BUC Menu

Transmit / AUPC Menu

Figure 3-13 Transmit / AUPC Menu

NOTE

This menu is only available for the DMD20LBST and the OM20.

3.3.4.2 Receive Menu

The Receive menu contains sub menus; General | IF, Data, Reed Solomon and ODU-LNB.

Receive General / IF Menu

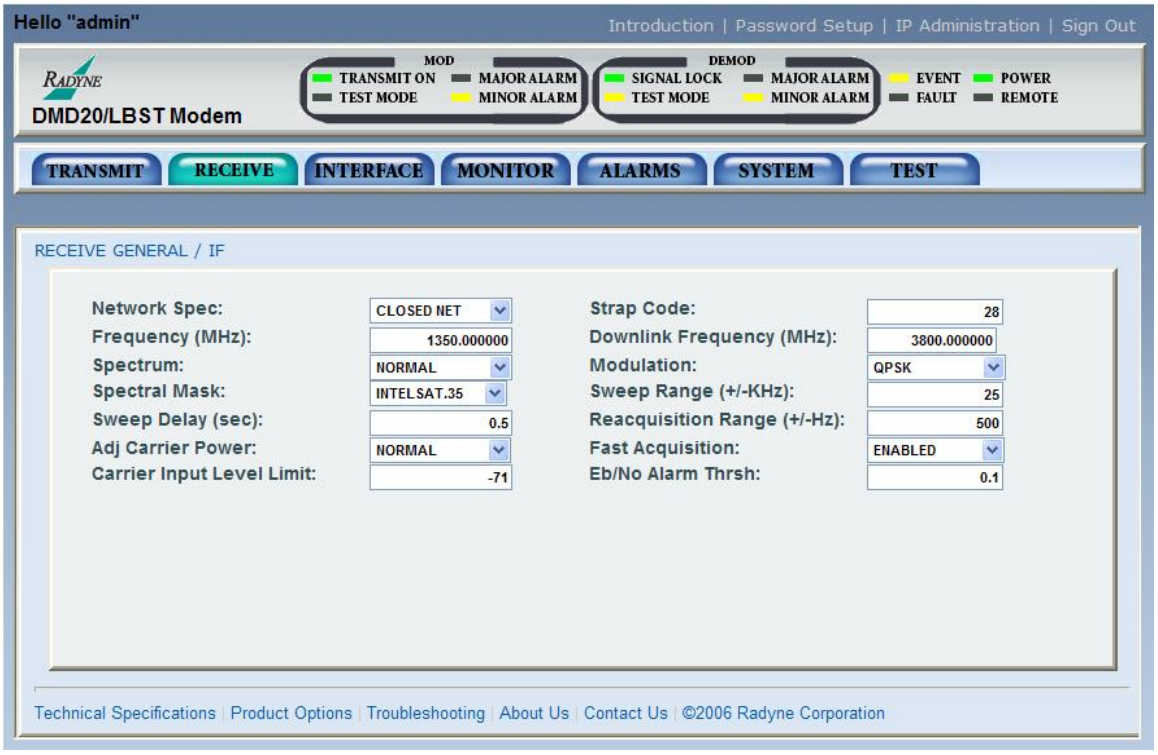


Figure 3-14 Receive General / IF Menu

NOTE

The Downlink Frequency (MHz) menu is only available with the DMD20LBST and the OM20.

Receive / Data Menu

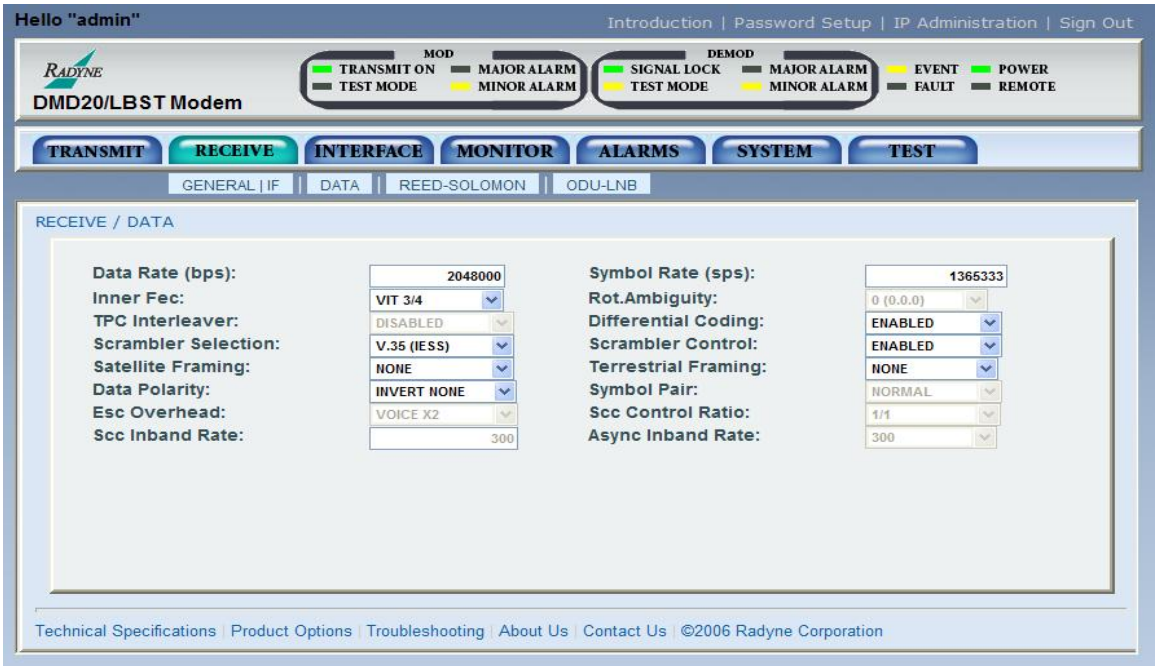


Figure 3-15 Receive / Data Menu

Receive / Reed-Solomon Menu

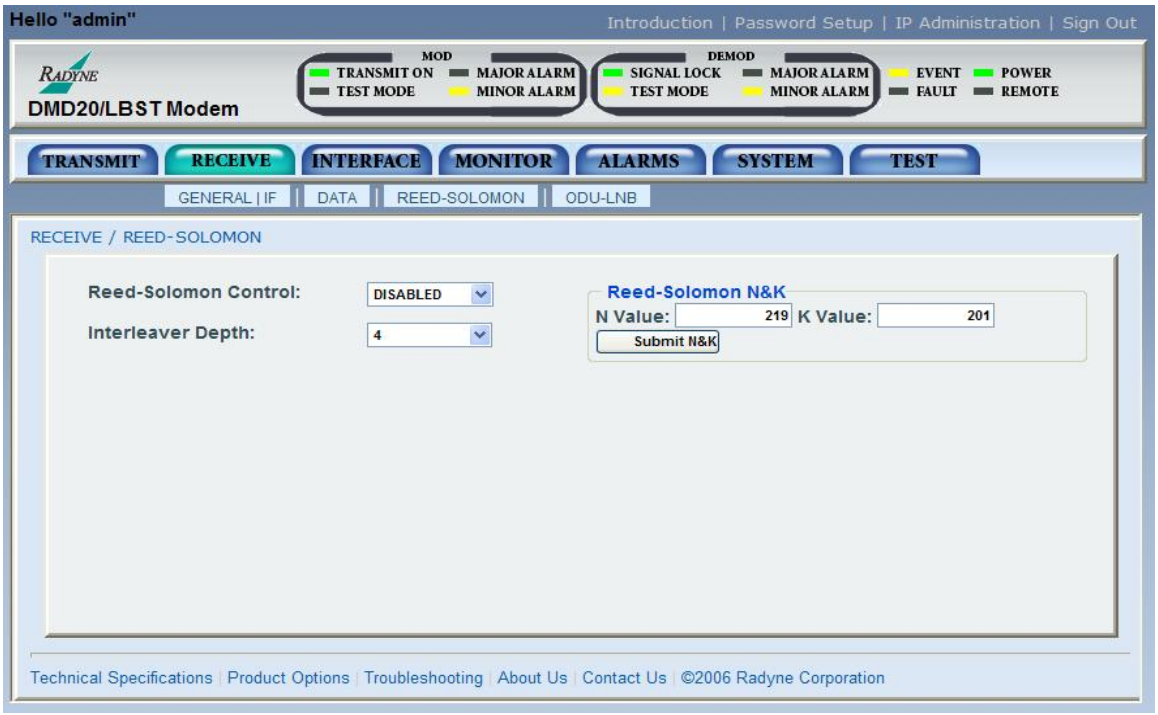


Figure 3-16 Receive / Reed-Solomon Menu

Receive / ODU-BUC Menu

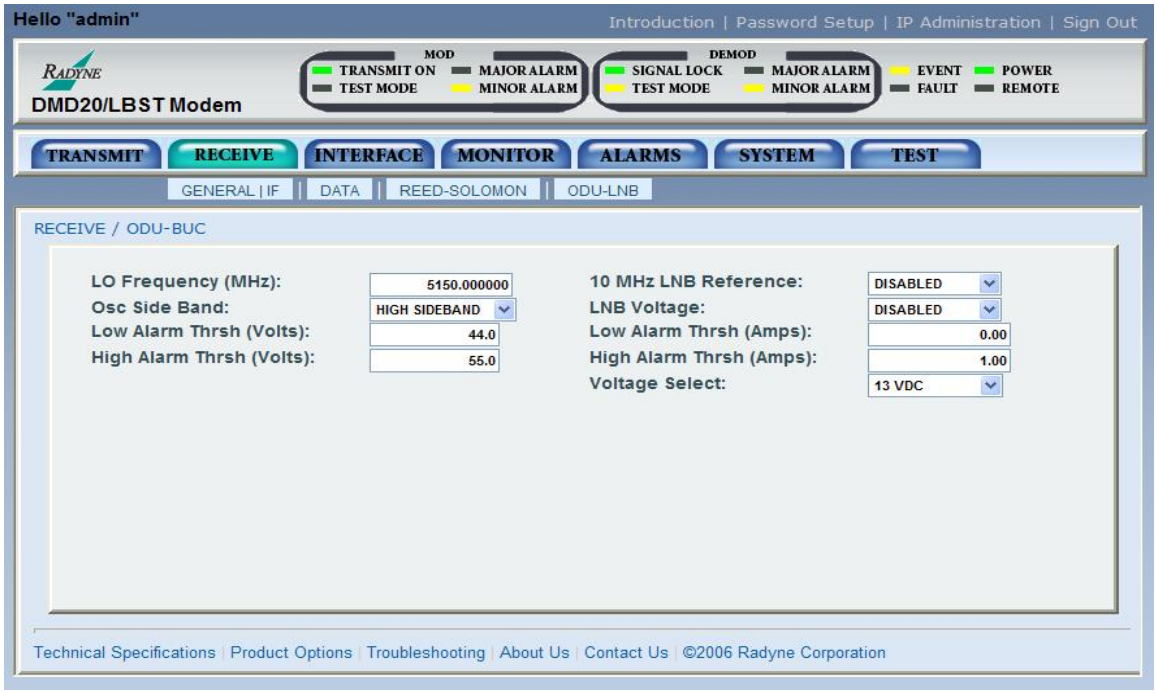


Figure 3-17 Receive / ODU-LNB Menu

NOTE

This menu is only available with the DMD20LBST and the OM20.

Receive / CNC Menu

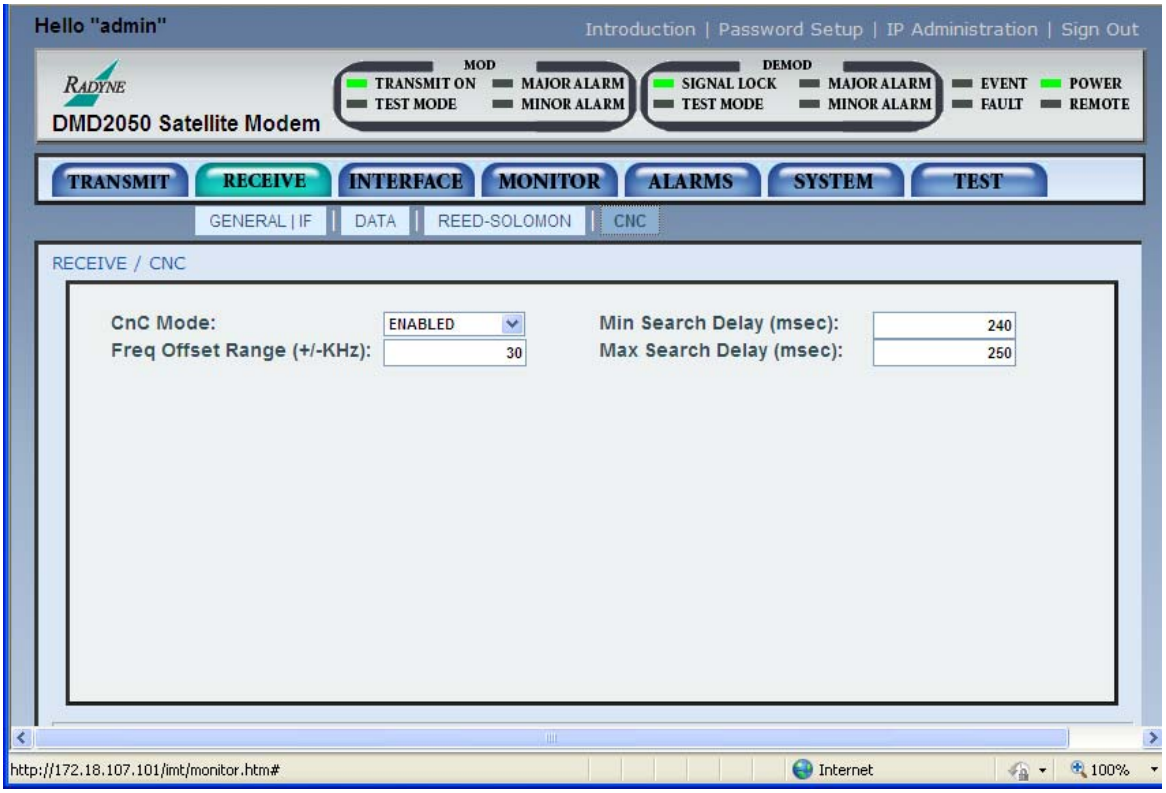


Figure 3-18 Receive / CNC Menu

NOTE

This menu is not available with the OM20.

3.3.4.3 Interface Menu

Interface / TX Setup Menu

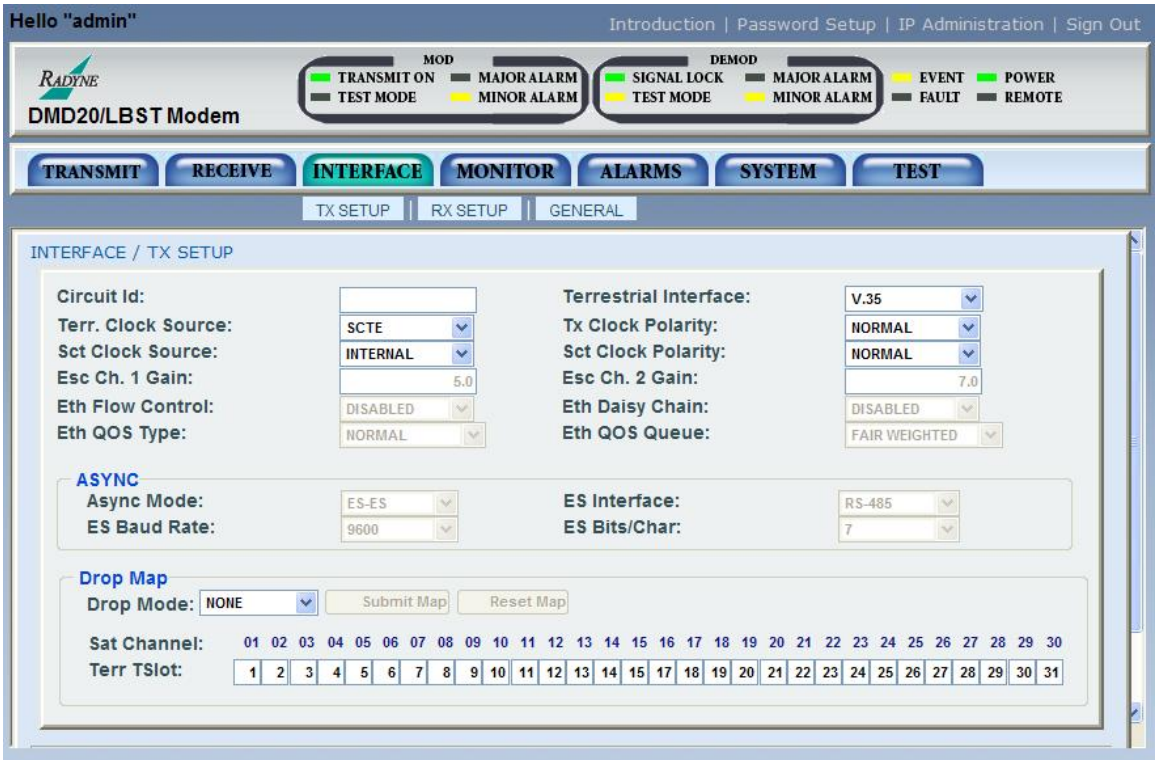


Figure 3-19 Interface / TX Setup Menu

Interface / RX Setup Menu

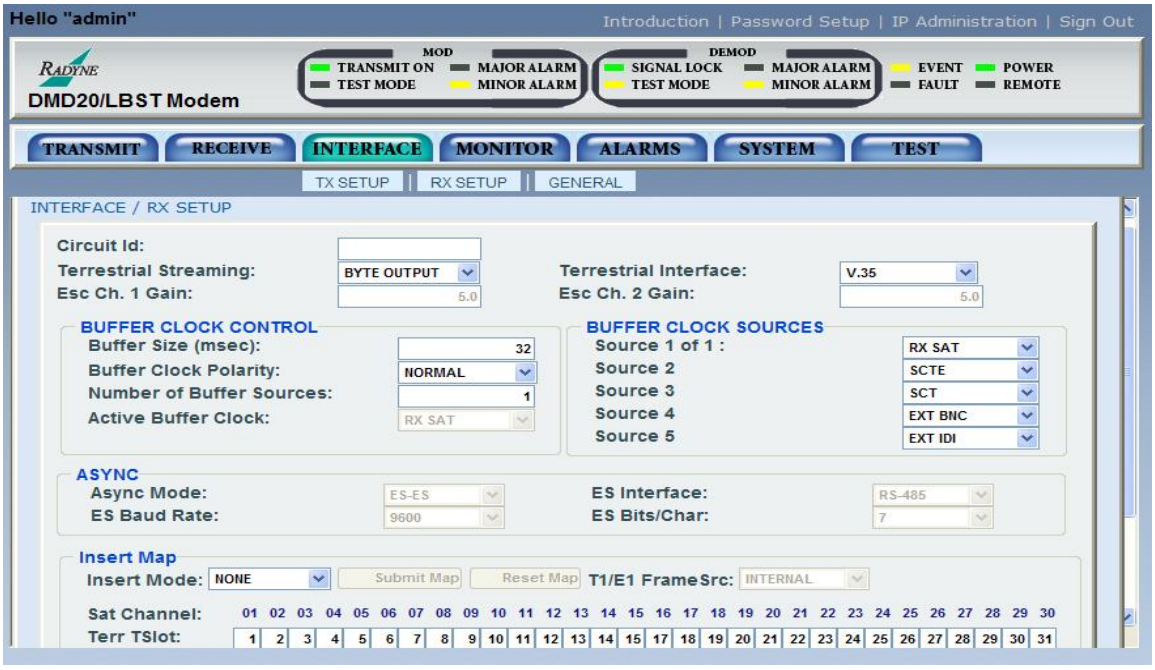


Figure 3-20 Interface / RX Setup Menu

Interface / General Menu

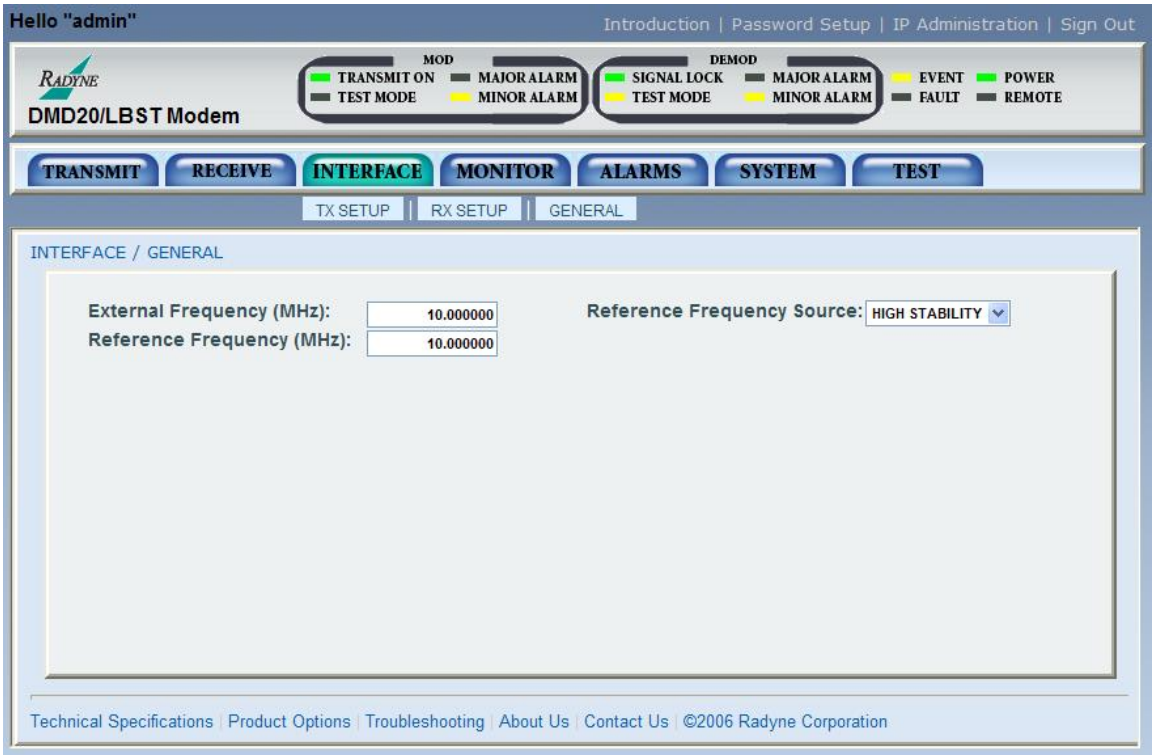


Figure 3-21 Interface / General Menu

3.3.4.4 Monitor / Voltages Menu

Monitor / General | Voltages

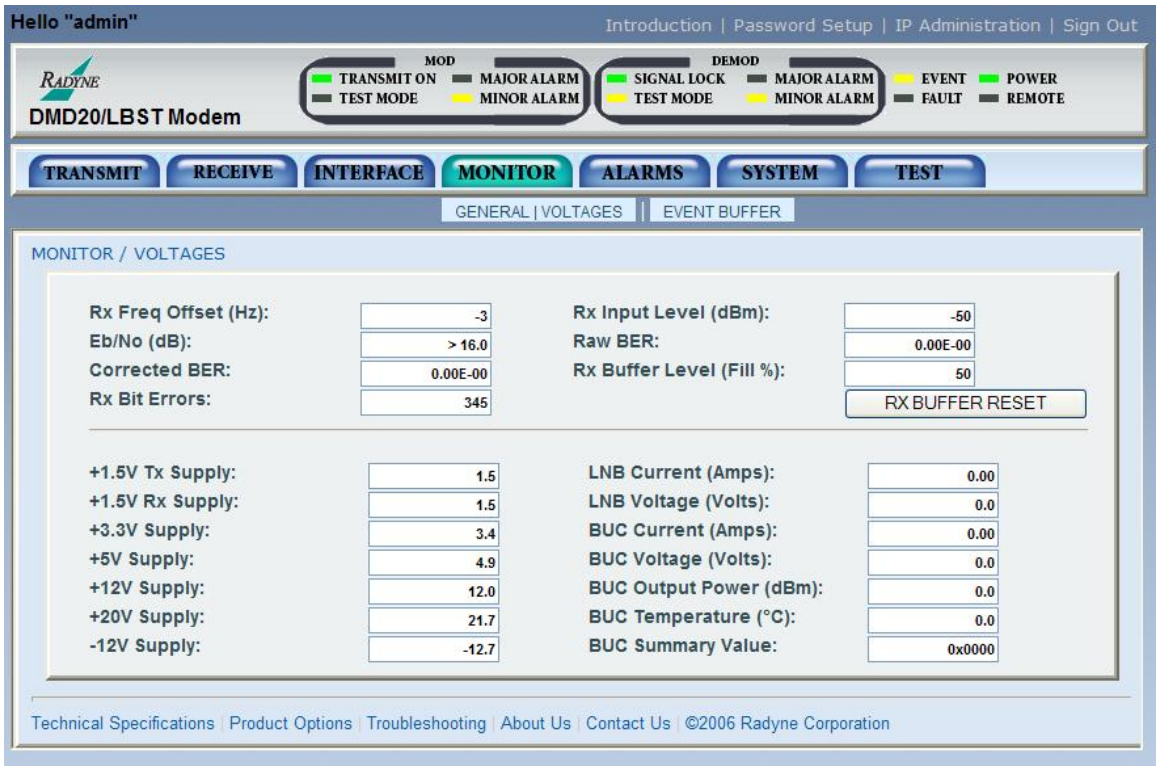


Figure 3-22 Monitor / Voltages Menu

NOTE

LNB and BUC options are only available on the DMD20LBST and the OM20.

Monitor / Ethernet Link Status

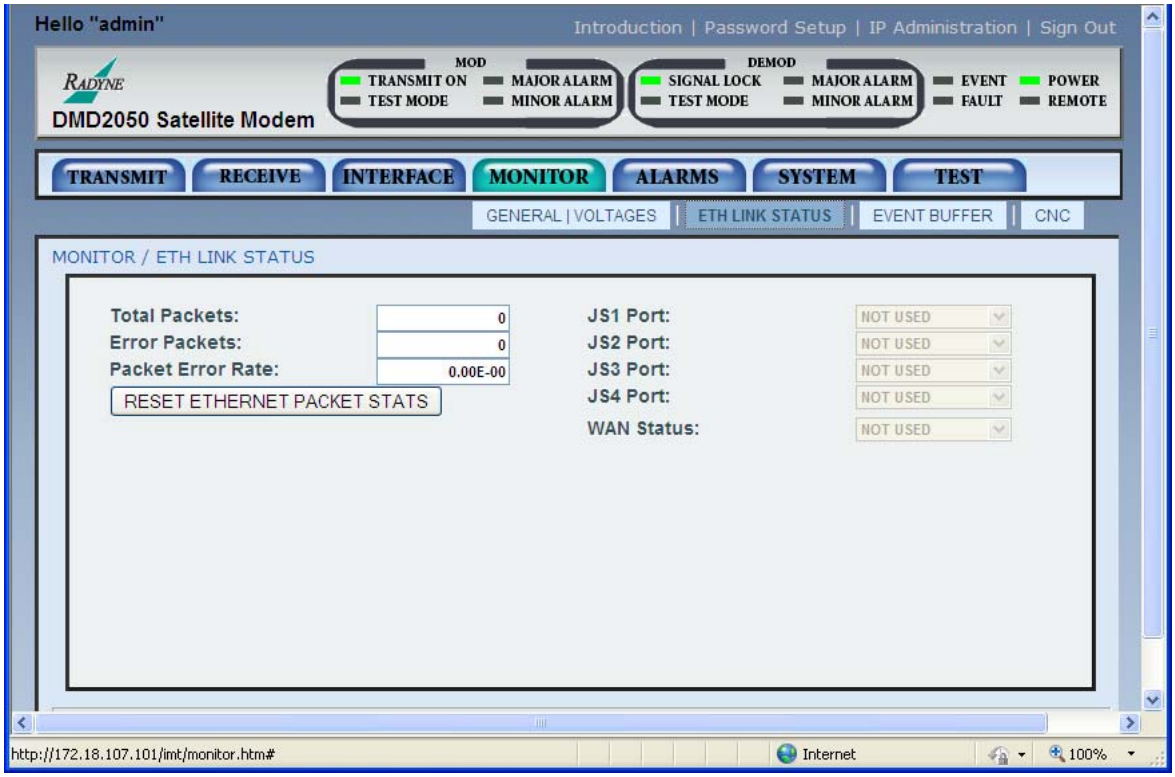


Figure 3-23 Monitor / Ethernet Link Status

NOTE

Ethernet Link Status Options are only available if a Ethernet Option Card is installed into the unit.

Monitor / Event Menu

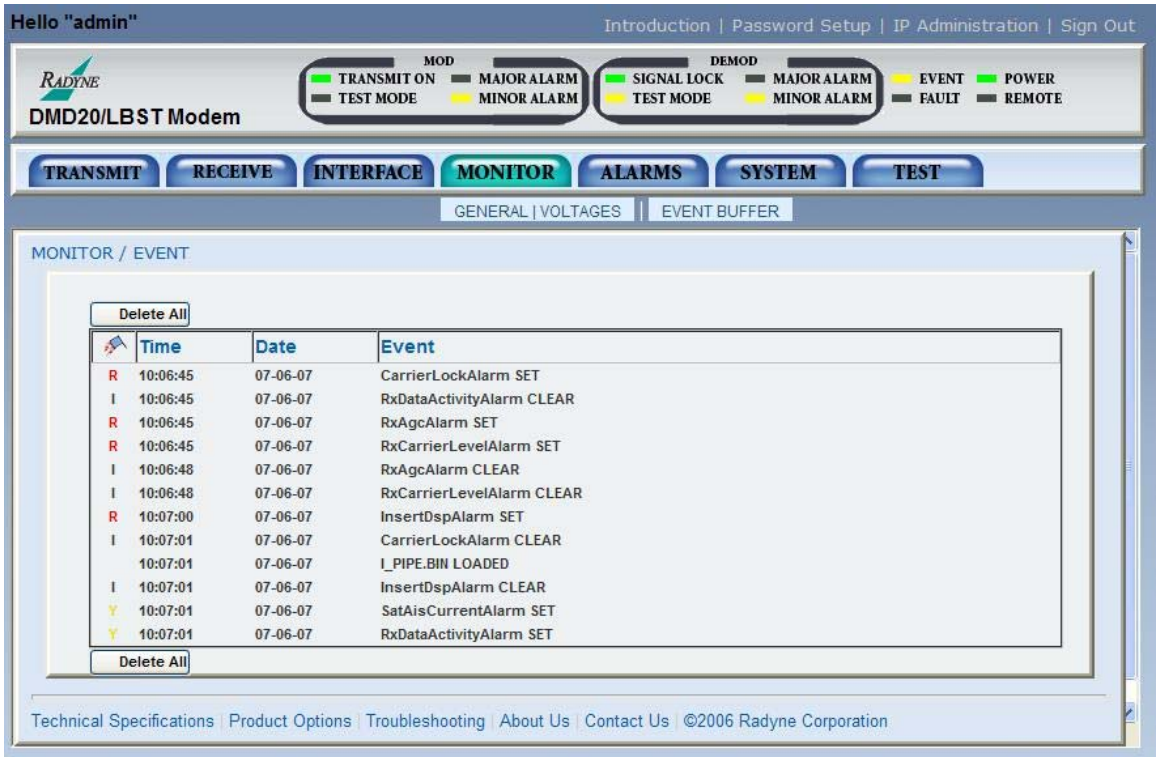


Figure 3-24 Monitor / Event Menu

Delete All: Cleans the entire event buffer.

Event Type:

I **Informational**

Y **Yellow alarm. Indicates a transmit or receive warning condition.**

R **Red alarm. Indicates a transmit or receive failure, losing traffic.**

NOTE

The Event Buffer may be sorted by warning level, time, date, or event description. This feature may be used to further investigate event occurances.

Monitor / CNC

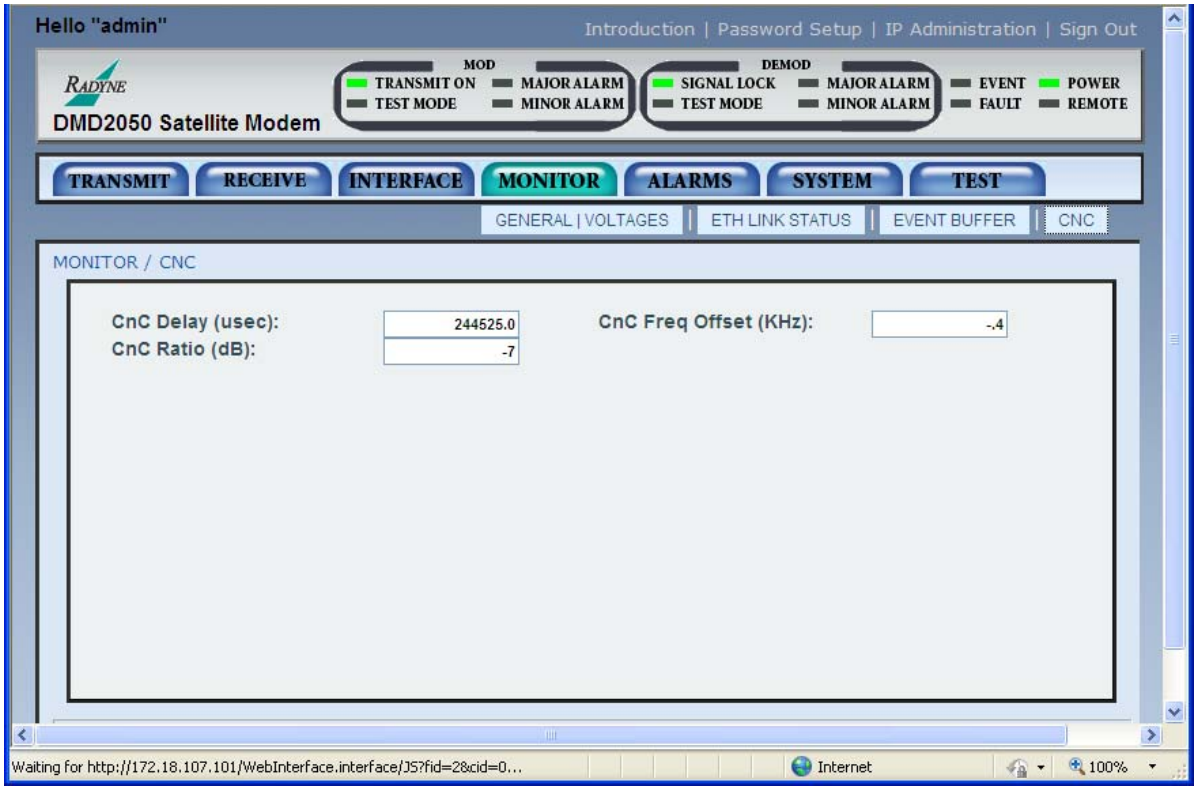


Figure 3-25 Monitor / Carrier in Carrier Menu

NOTE

This menu is not available with the OM20.

3.3.4.5 Alarms Menu

Alarms / Transmit Menu

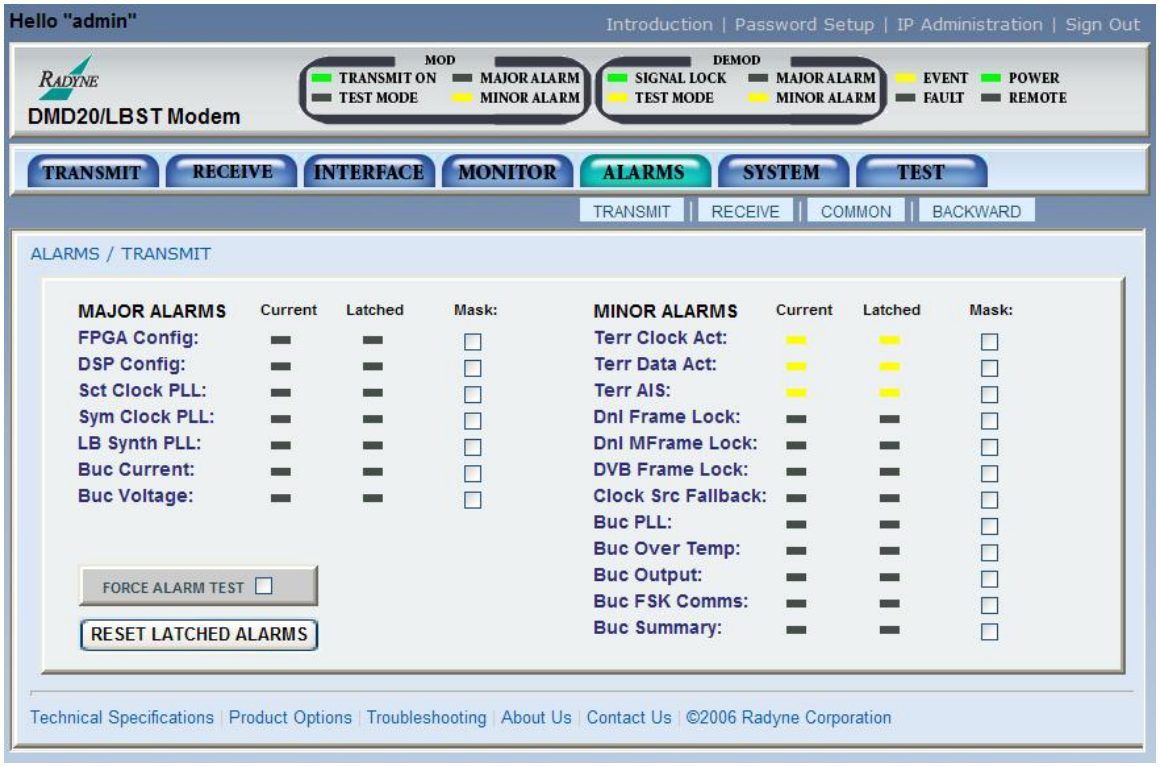


Figure 3-26 Alarms / Transmit Menu

Reset Latched Alarms: Clicking on this button will reset (Clear) all Latched Alarms

Force Alarm Test: Clicking on this button will will force alarms

Alarms / Receive Menu

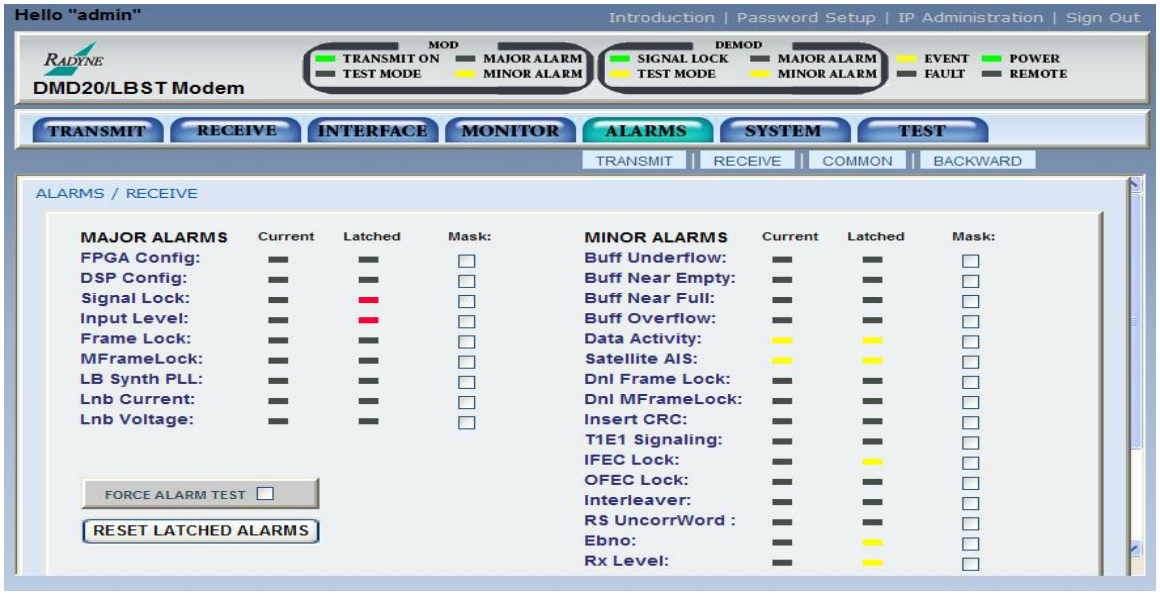


Figure 3-27 Alarms / Receive Menu

Reset Lathed Alarms: Clicking on this button will reset (Clear) all Latched Alarms

Force Alarm Test: Clicking on this button will force alarms.

Alarms / Common Menu

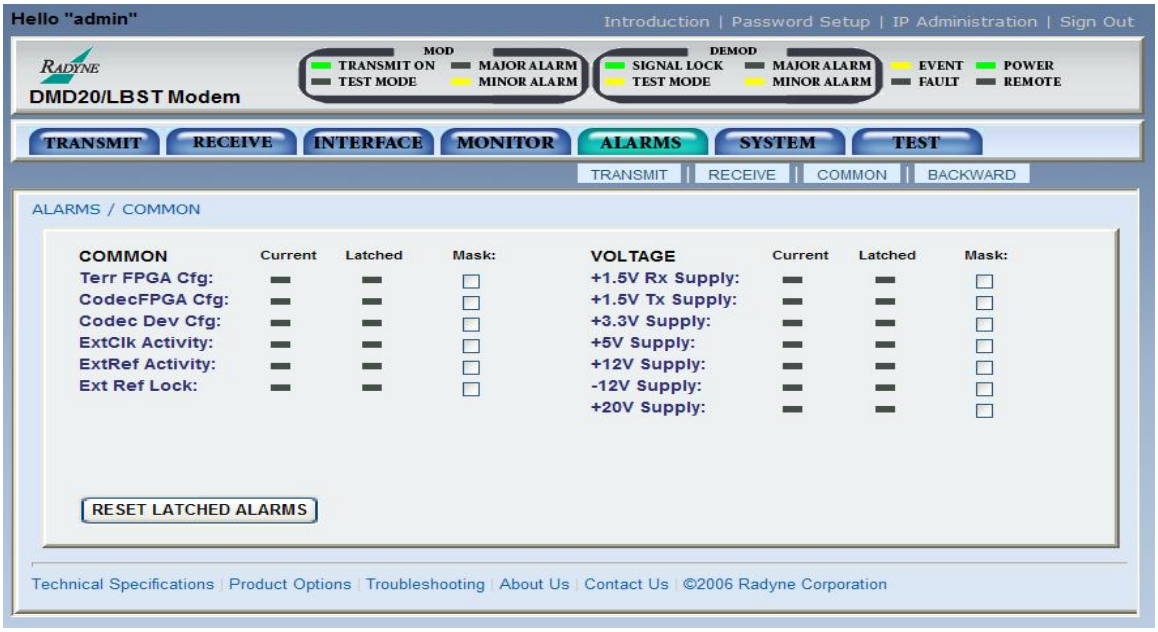


Figure 3-28 Alarms / Common Menu

Reset Latched Alarms: Clicking on this button will reset (Clear) all Latched Alarms

Alarms / Backward Menu

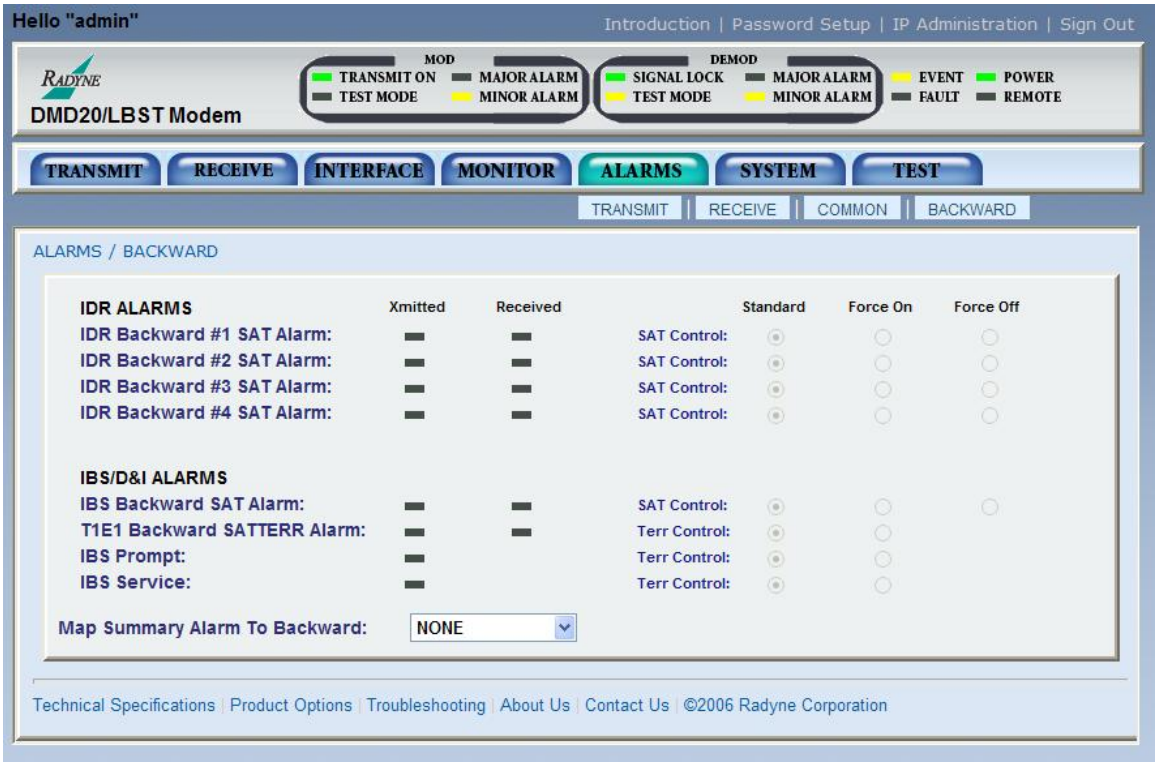


Figure 3-29 Alarms / Backward Menu

3.3.4.6 System Menu

System / Terminal / Remote Menu

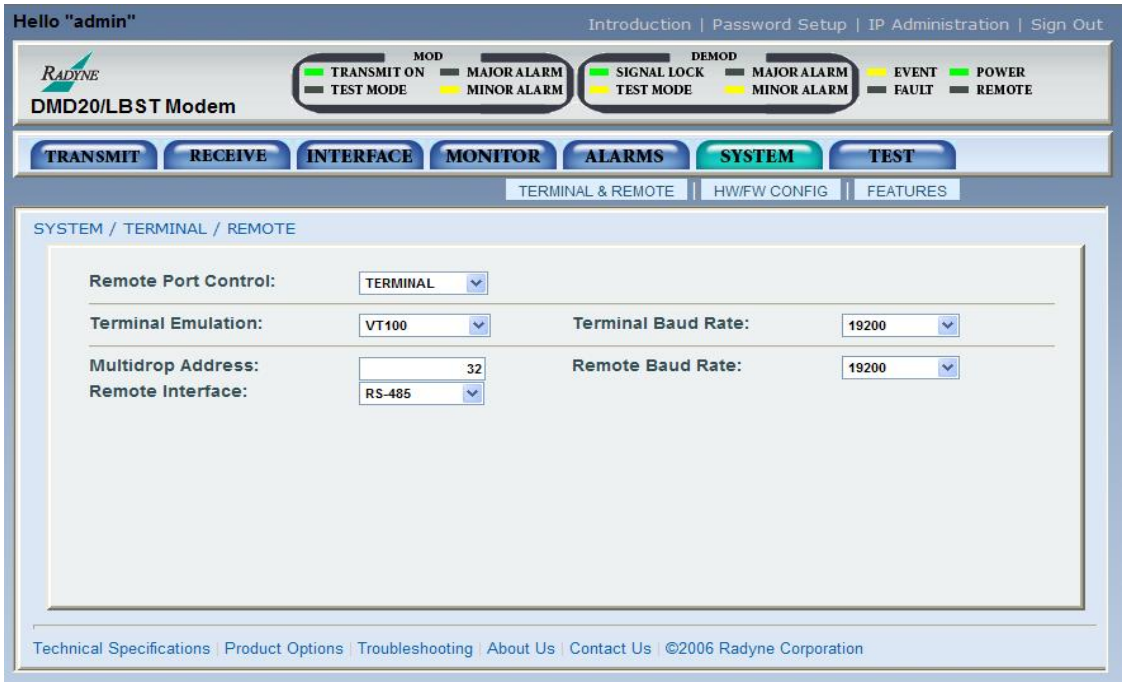


Figure 3-30 System / Terminal / Remote Menu

System / HW-SW Config Menu

Figure 3-31 System / HW-SW Config Menu

System / Features Menu

Figure 3-32 System / Features

The Web Browser menu allows viewing of actively enabled features. Each feature displays a series of symbols that describe feature status. The following symbols indicate:

	Installed
	No hardware available. Requires hardware for upgrade.
	Feature is in Demo Mode and will expire.
	Key Code Required
	The telephone image is present when feature is enabled, but the modem has not detected the hardware or hardware feature has failed.

Features upgrades can also be implemented through the Web Browser interface.

3.3.4.7 Test Menu

Test Pattern/Carrier Menu

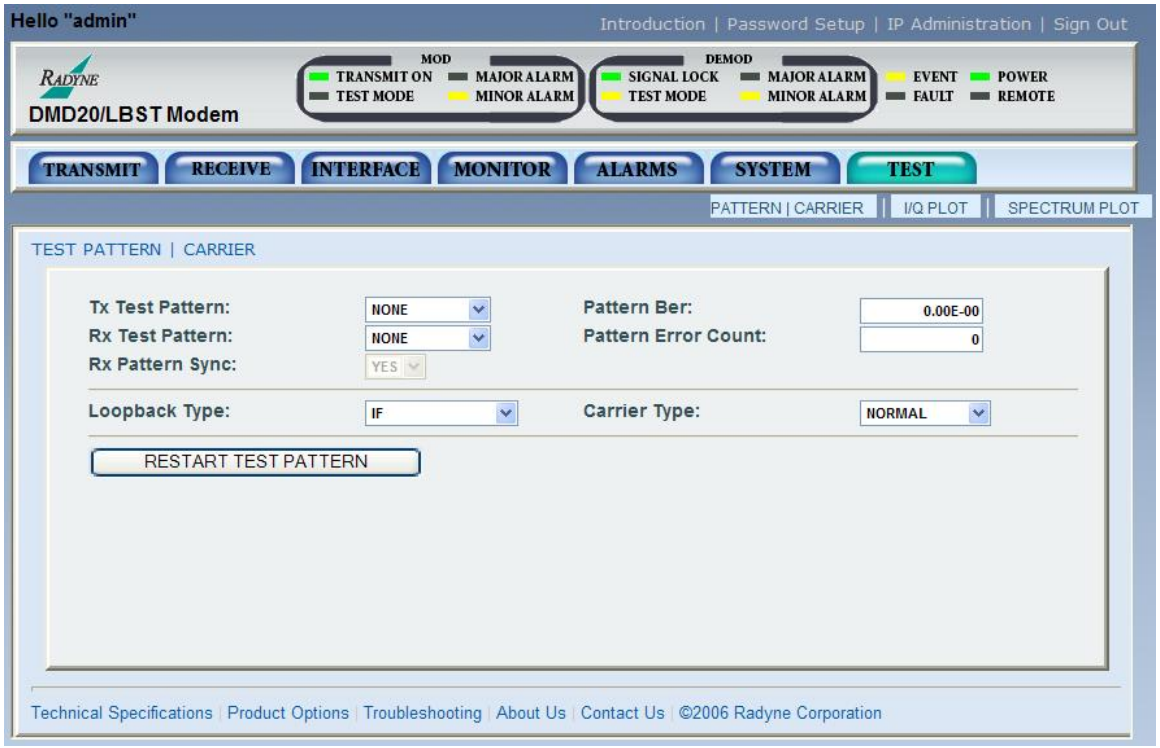


Figure 3-33 Test Pattern/Carrier

Test I/Q Plot

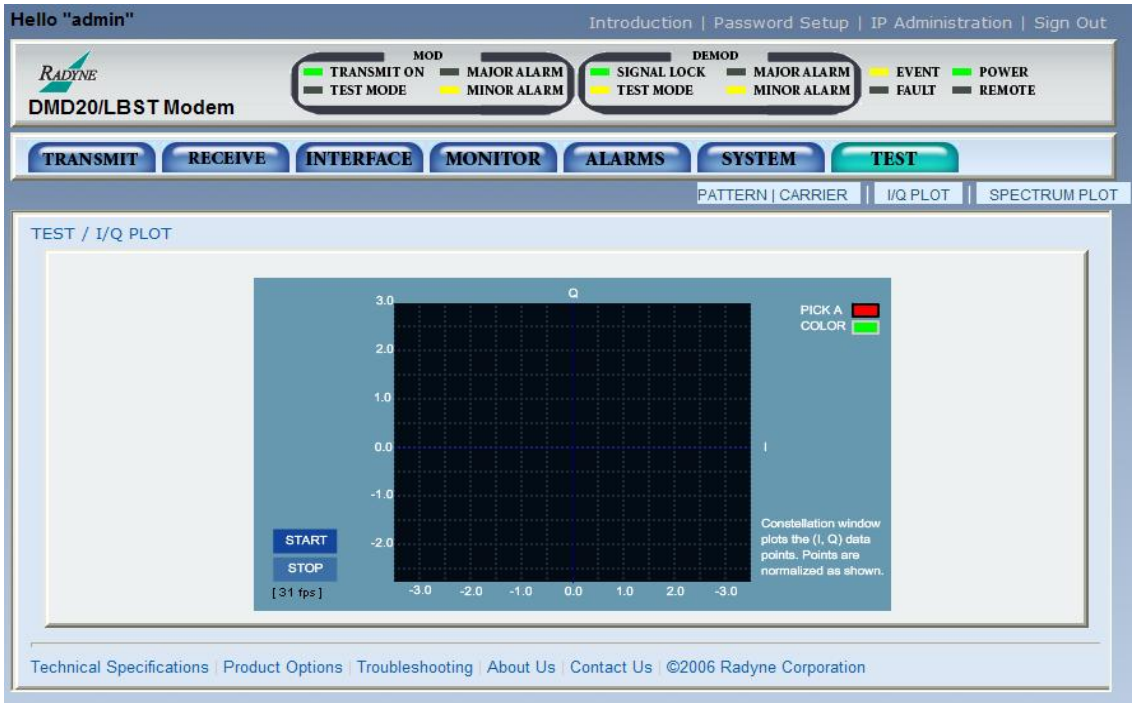


Figure 3-34 Test I/Q Plot

Test Spectrum Plot

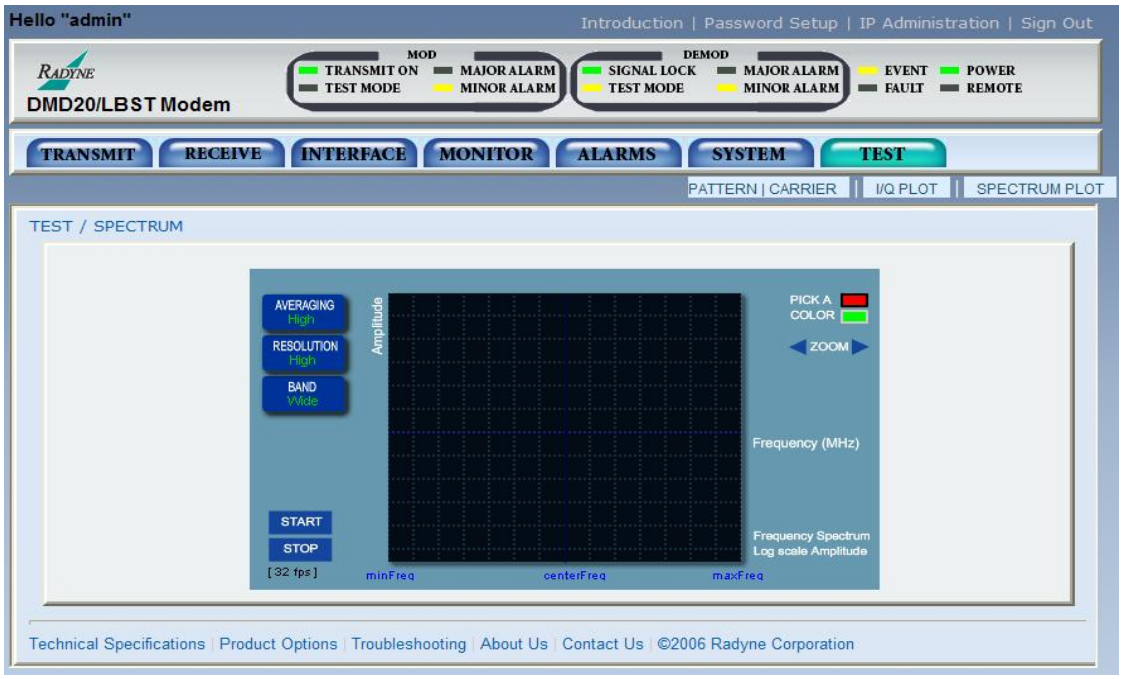


Figure 3-35 Test Spectrum Plot

Notes:

Chapter 4. Protocol Terminal Menus

4.1 Terminal Mode Control

The Terminal Mode Control allows the use of an external terminal or computer to monitor and control the modem from a full screen interactive presentation operated by the modem itself. No external software is required other than VT-100 Terminal Emulation Software (e.g. “Procomm” for a computer when used as a terminal. The Control Port is normally used as an RS–232 Connection to the terminal device. The RS-232 operating parameters can be set using the modem Front Panel and stored in EEPROM for future use (refer to Section 4.11 for setup and terminal screens).

4.2 Modem Terminal Mode Control

The modem can be interactively monitored and controlled in the Terminal Mode, with a full screen presentation of current settings and status. Programming is accomplished by selecting the item to be modified and pressing the terminal key of the option number. For example, to change the transmit data rate, enter ‘33’ at the terminal. The modem will respond by presenting the options available and requesting input. Two types of input may be requested. If the input is multiple choice, the desired choice is selected by pressing the ‘Space’ key. When the desired option is displayed, press the ‘Enter’ key to select that option. The other possible input type requires a numerical input (such as entering a frequency or data rate. This type of input is followed by pressing the ‘Enter’ or carriage return key. An input can be aborted at any time by pressing the ‘ESC’ key. Invalid input keys cause an error message to be displayed on the terminal.

The Terminal Control Mode supports serial baud rates of 150, 300, 1200, 2400, 4800, 9600, 19200, and 38400. The connection must be set for 8 data bits, 1 stop bit and no parity (8,N,1). Three terminal emulations are supported: VT-100, WYSE 50, and ADDS-VP.

“$” is used for setting the screen when the terminal is used for the first time the non-volatile memory is reset.

4.2.1 Modem Setup for Terminal Mode (factory only)

Terminal Mode Communications and Protocol is set from the Front Panel Control by setting the “Control Mode” Parameter to “Terminal”, and then setting the “Modem Port”, “Term Baud” and “Emulation” Parameters as desired. Then a terminal is connected to Terminal Connector on the Back Panel. All operating software for the Terminal Mode is contained within the Modem Internal Control Software.

A “break” signal on the communications line, pressing “ESC” on the terminal or Power On of the modem will initiate full screen terminal mode printing and redraw the full screen. The Terminal Mode displays the present status of all user parameters controlled and read by the processor, and offers a menu allowing change to any controlled parameter.

User Terminal Mode Set up - The modem will come from the factory pre-set to the Terminal mode. If it is necessary to set up the modem in the field attach the “Reset Connector” to J2 on the back of the modem. Cycle power and the modem will revert to default values for the terminal and Ethernet ports.

4.2.2 User Terminal Mode Set Up

The modem will come from the factory pre-set to the Terminal mode. If it is necessary to set up the modem in the field attach the “Reset Connector” to J2 on the back of the modem. Cycle power and the modem will revert to default values for the terminal and Ethernet ports.

The Terminal Control Mode is menu-driven and the allowable values for each item number will be shown. To change an item, type in its number followed by <ENTER>. If the parameter to be changed requires a numeric value, enter the number followed by <ENTER>. If the parameter is non-numeric, press <SPACE> to cycle through the list of available entries.

Items that do not have ID numbers are Status only and cannot be changed.

4.2.3 Connecting the Terminal

1. Connect the computer to the Remote Connector and the terminal/computer using the RS-232 Cable.
   - o DMD20/50/2050 Remote Terminal (J20)
   - o OM20 Remote Terminal (J2)

2. On the modem with front panel access, enable the terminal by selecting Terminal Mode (located under the System - Control Mode Menu) from the GUI Interface.

3. Verify that your emulation software is set to the following:

   8 data bits
   no parity
   1 stop bit

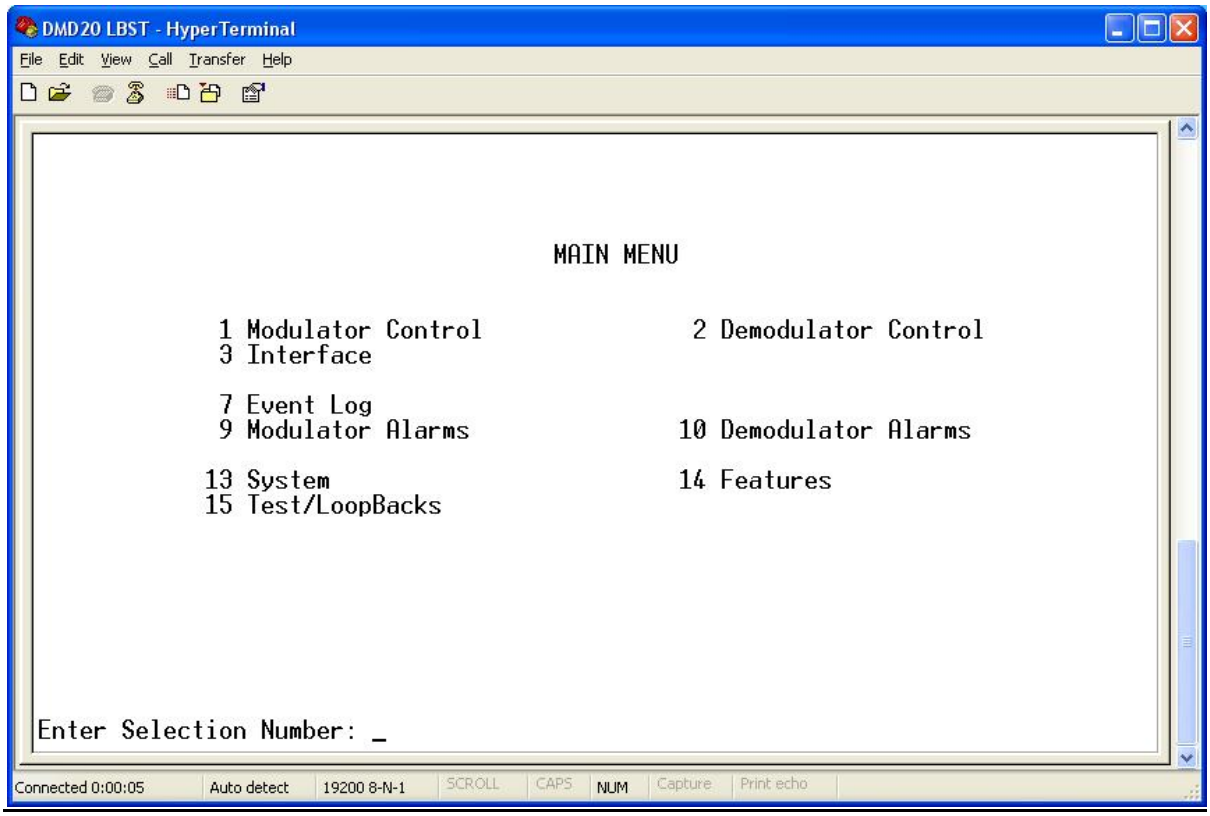
   Modify the selection, if necessary, to match the settings (the GUI Interface ‘SYSTEM’ Sub-Menu contains all the Terminal Emulation Controls).

4.2.4 Terminal Screens

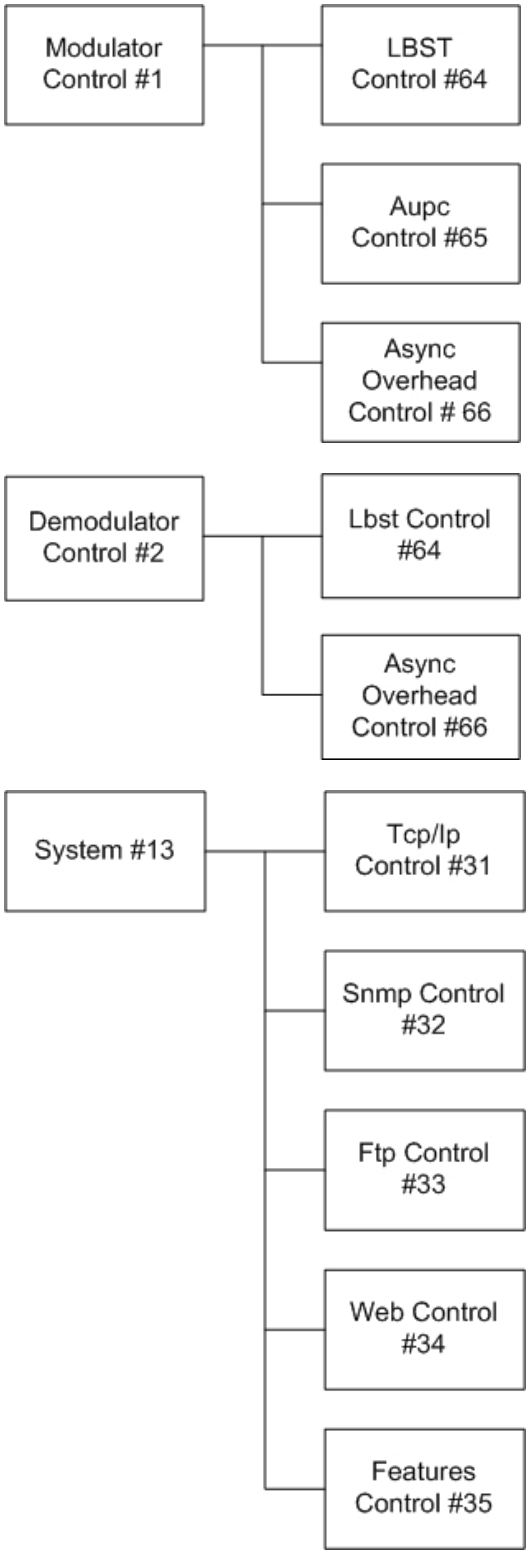
1. Modem configuration can be monitored and controlled via a full screen presentation of current settings and status. The <Esc> Key redraws the entire screen and aborts input any time. The Spacebar refreshes the status area and is used to scroll through selection when in user input mode.

2. To modify an item, the user simply presses its terminal selection followed by <Enter>. The modem responds by presenting the options available and requesting input. If the input is multiple choices, the user is prompted to use the Spacebar to scroll to the desired selection and then press <Enter>. An input can be aborted at any time by pressing <Esc>. Invalid input keys cause an error message to be displayed on the terminal. Some input or display status only appears when the user has the right access levels.

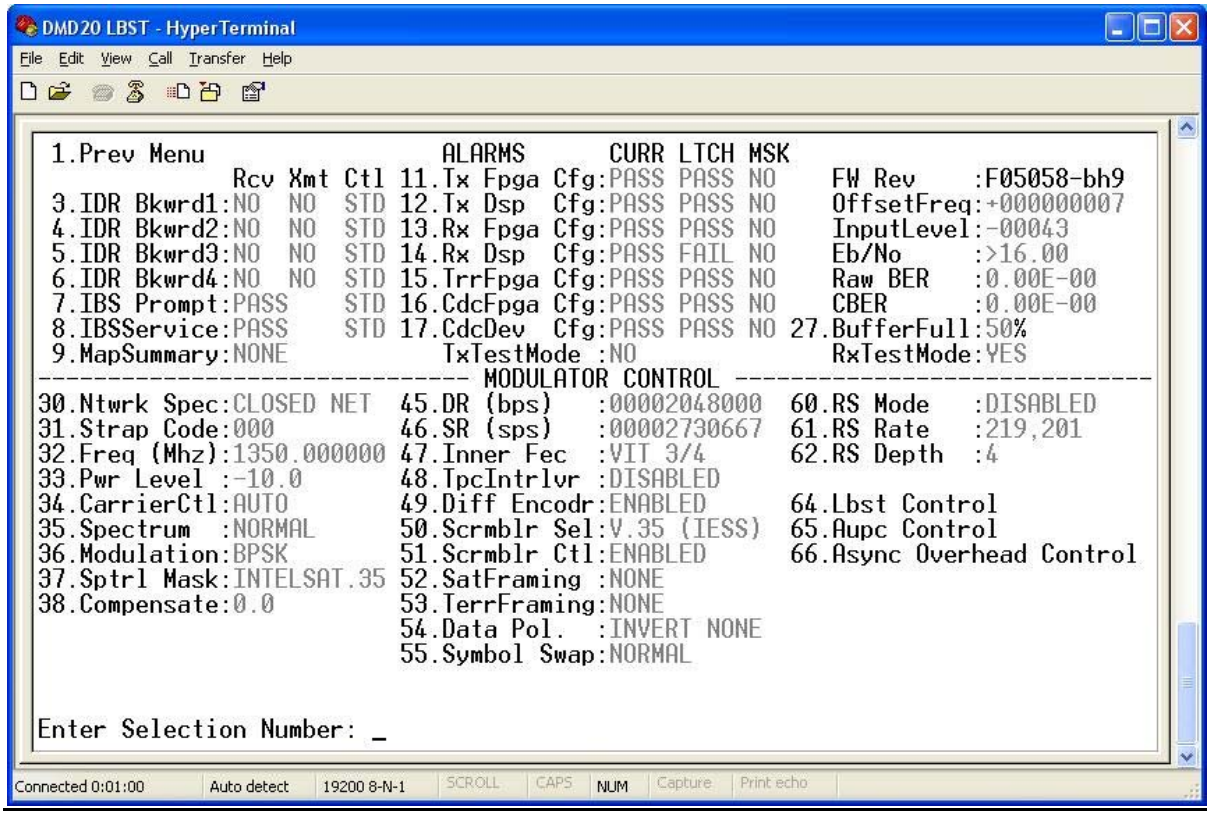
Main Menu Screen:



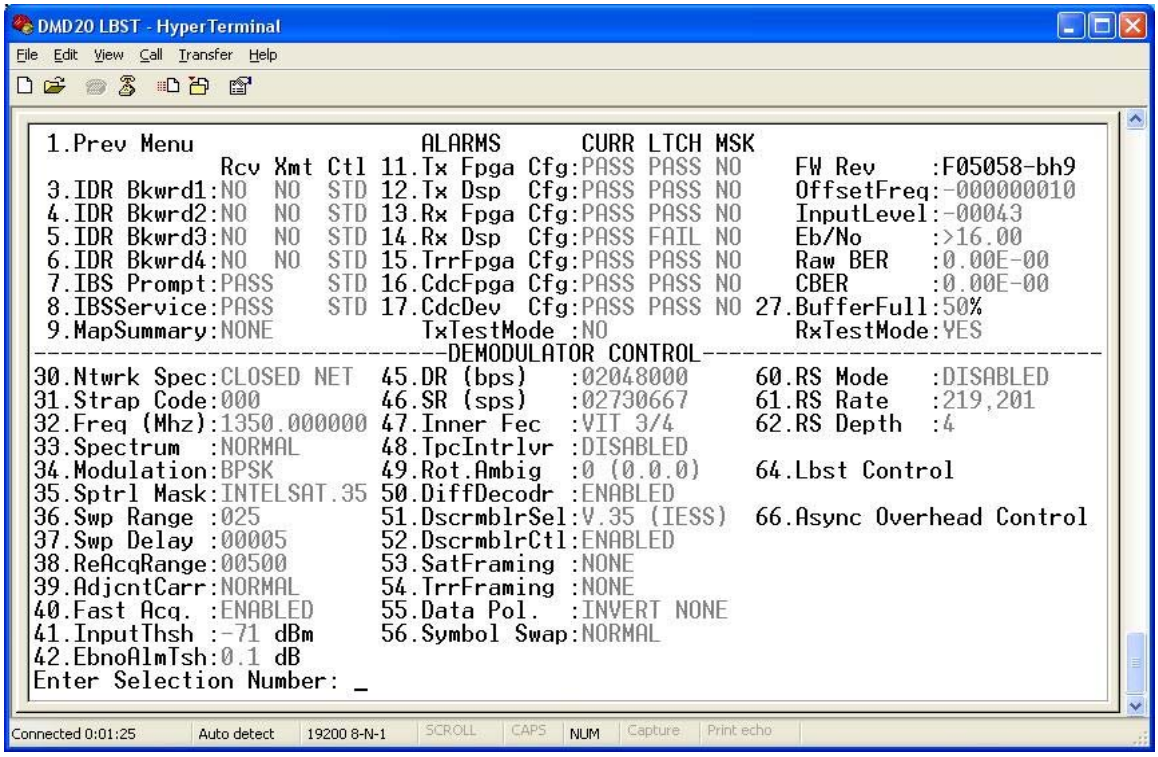
The charts that follow identify the Menu Control's Sub-Menus:



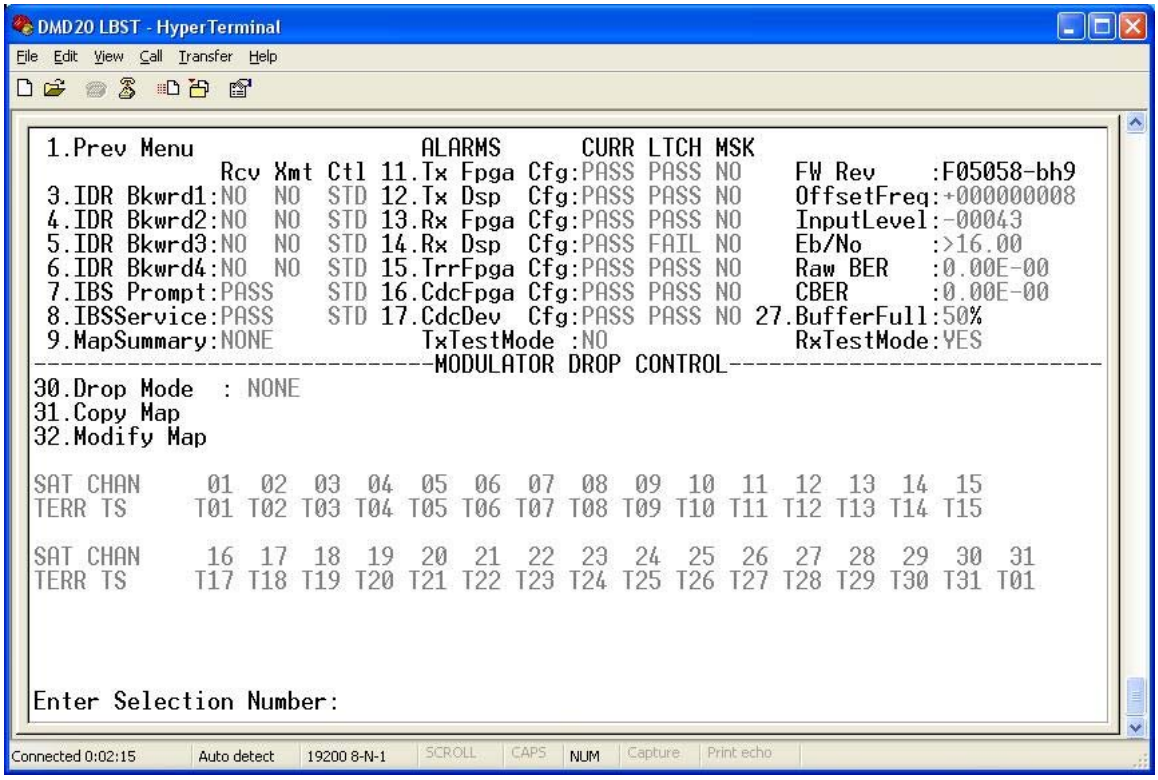
Modulator Control Screen:



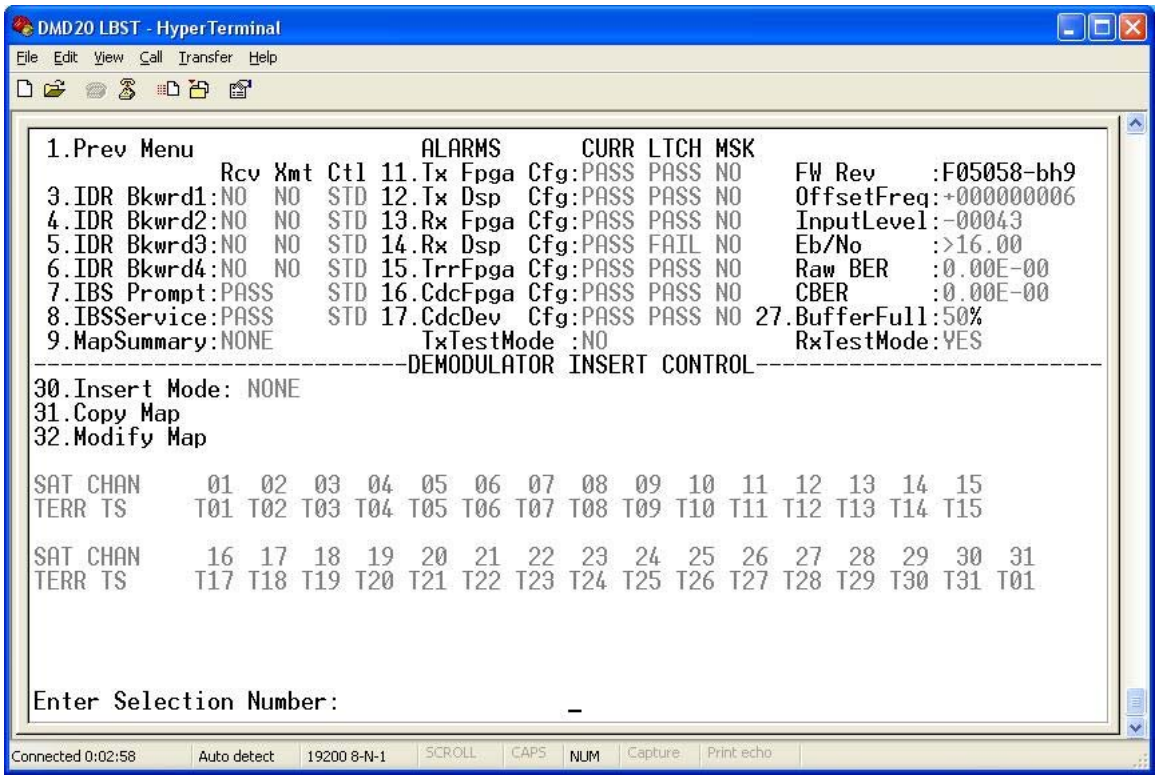
Demodulator Control Screen:



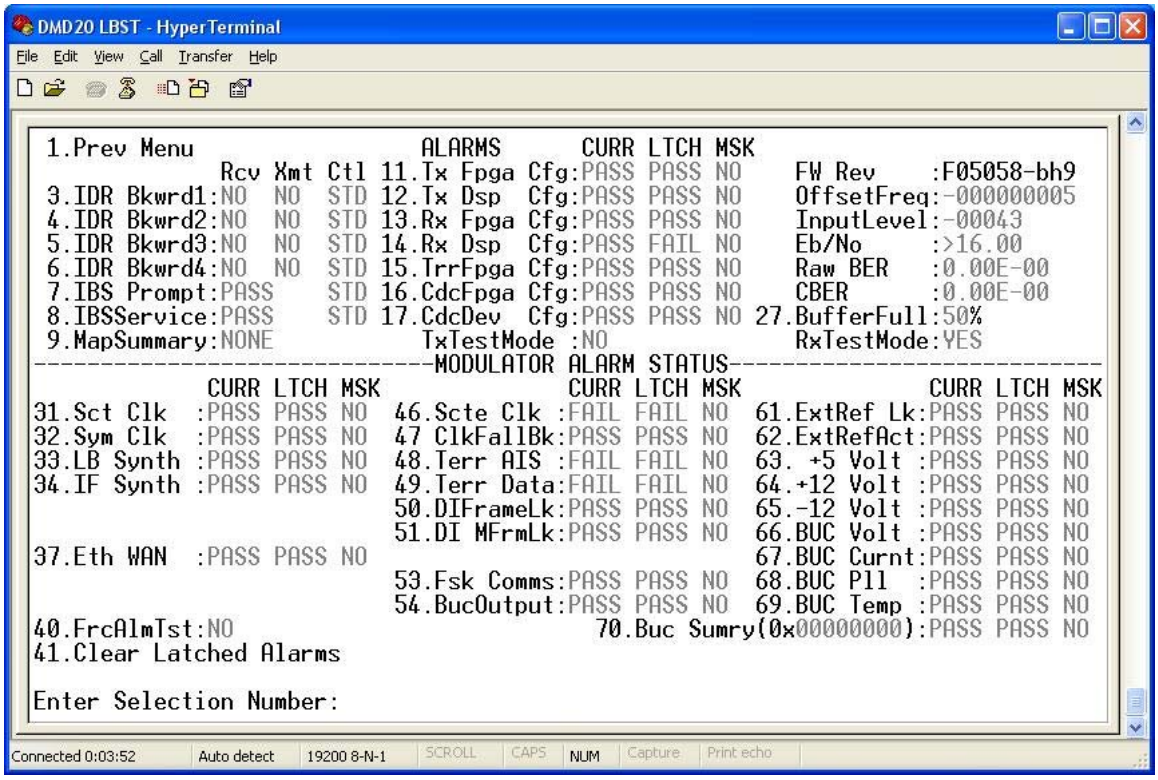
Modulator Drop Control Screen:



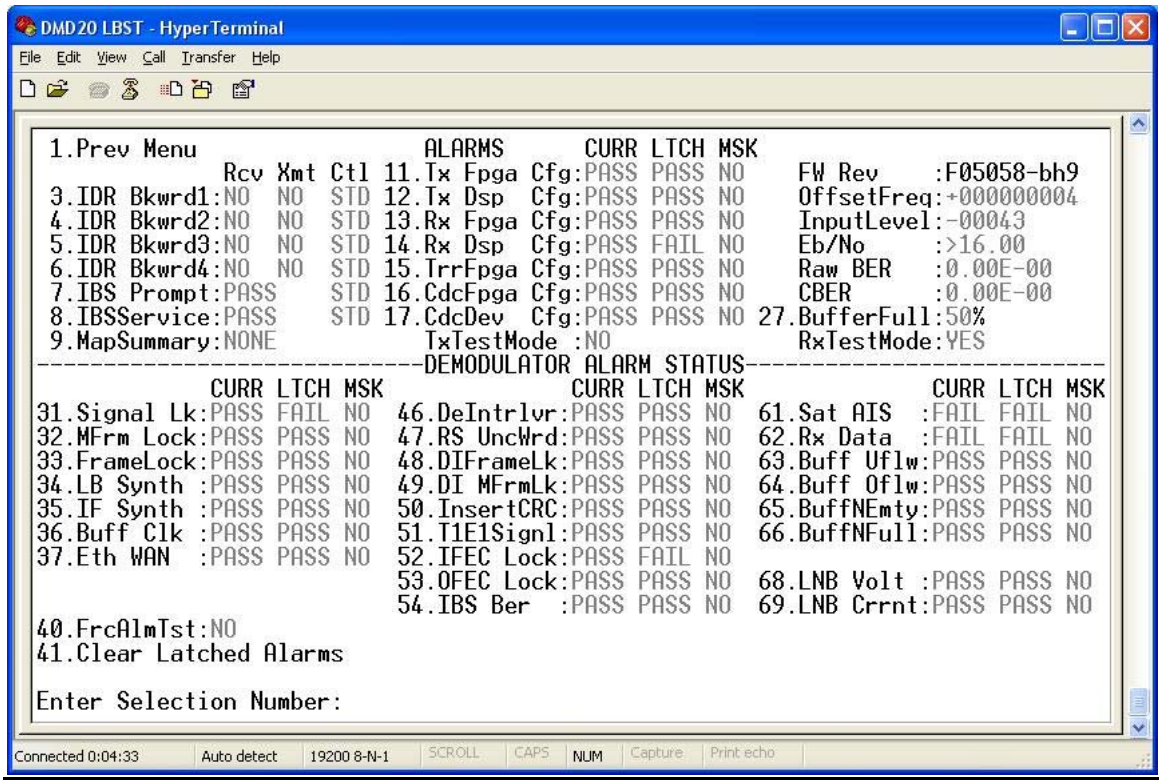
Demodulator Insert Control Screen:



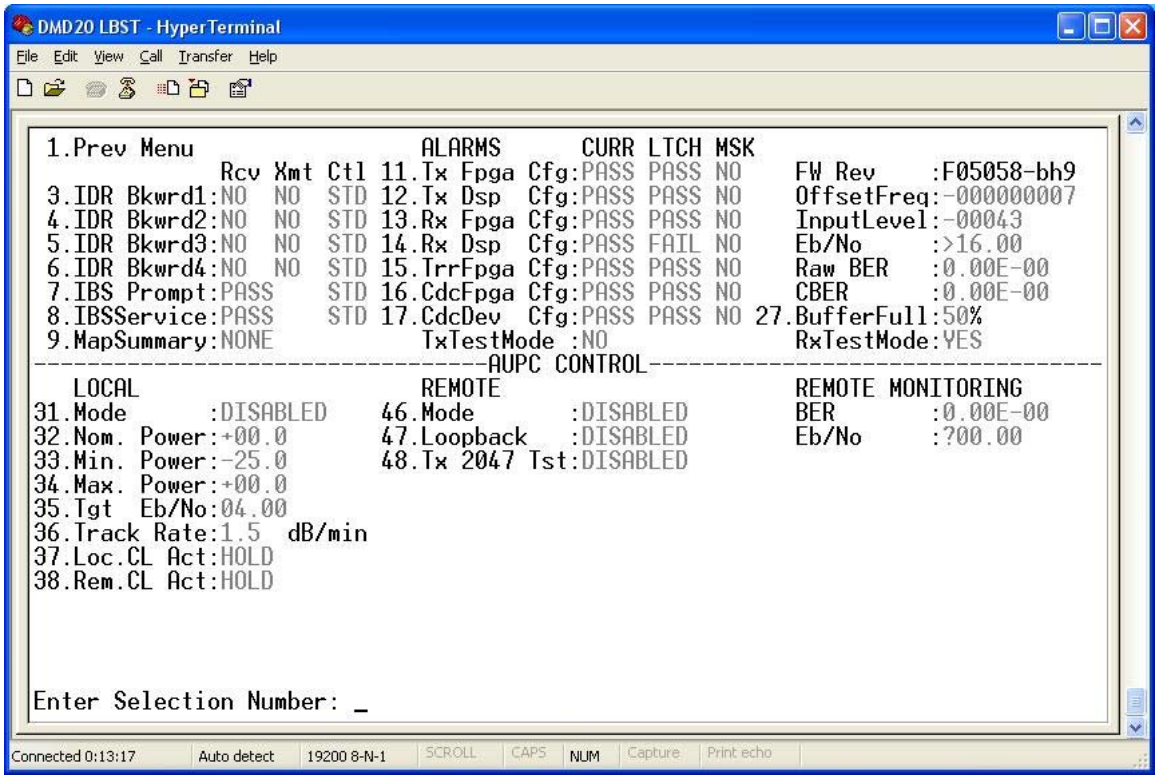
Modulator Alarm Status Screen:



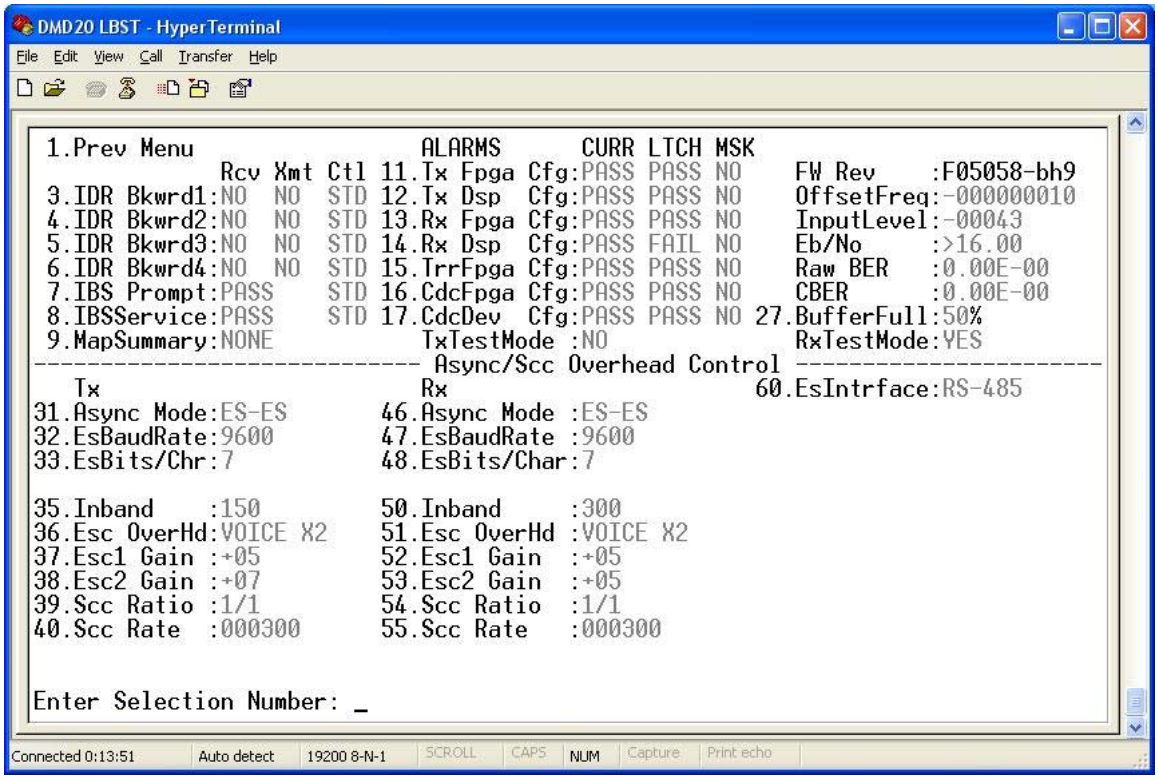
Demodulator Alarm Status Screen:



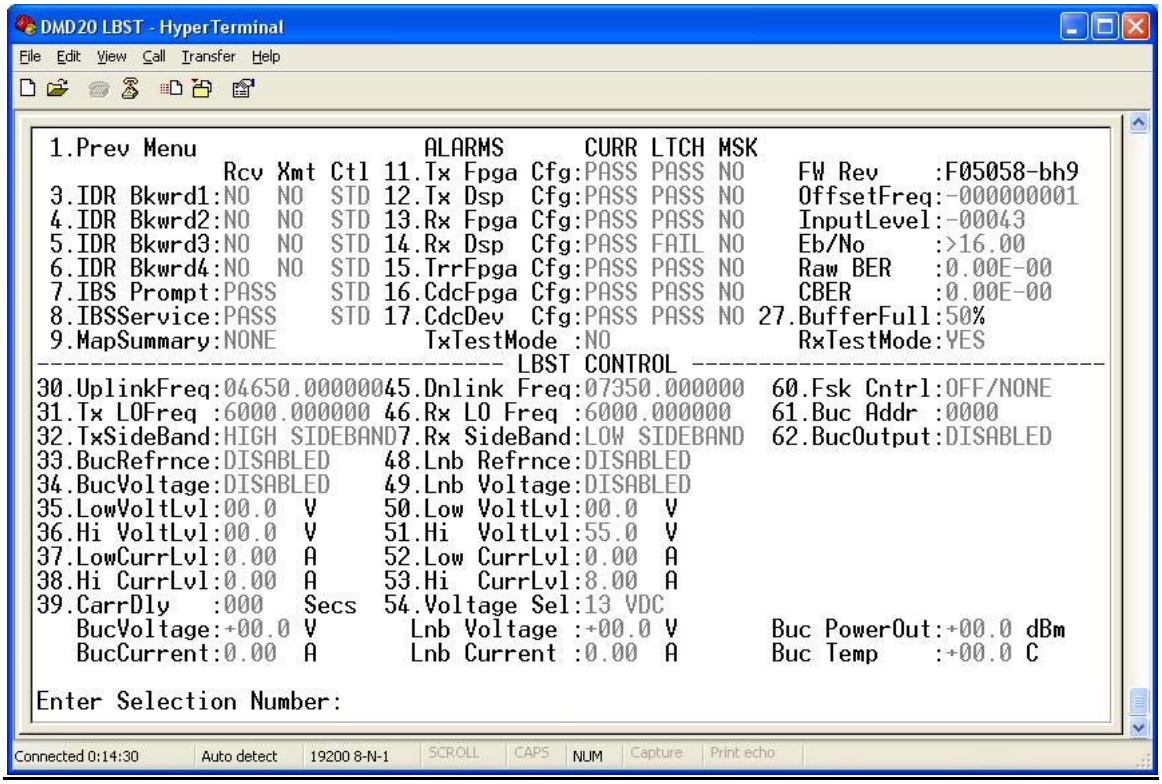
AUPC Control Screen:



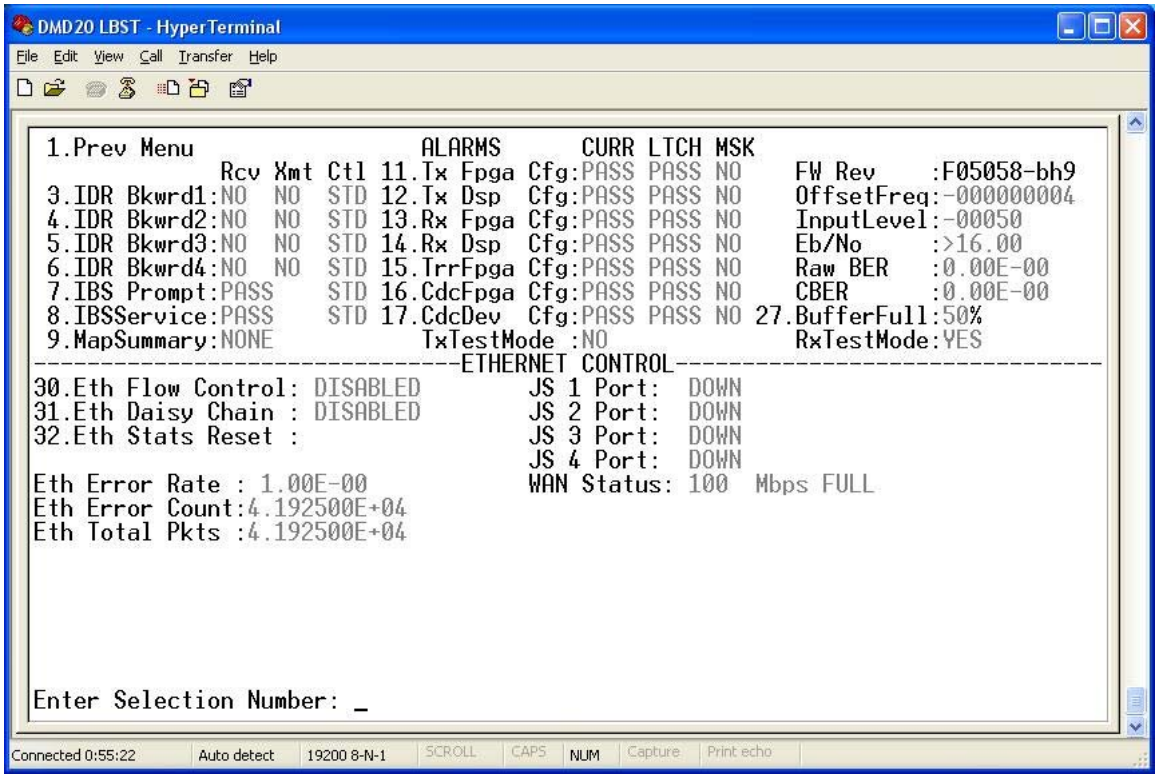
ASYNC Control Screen:



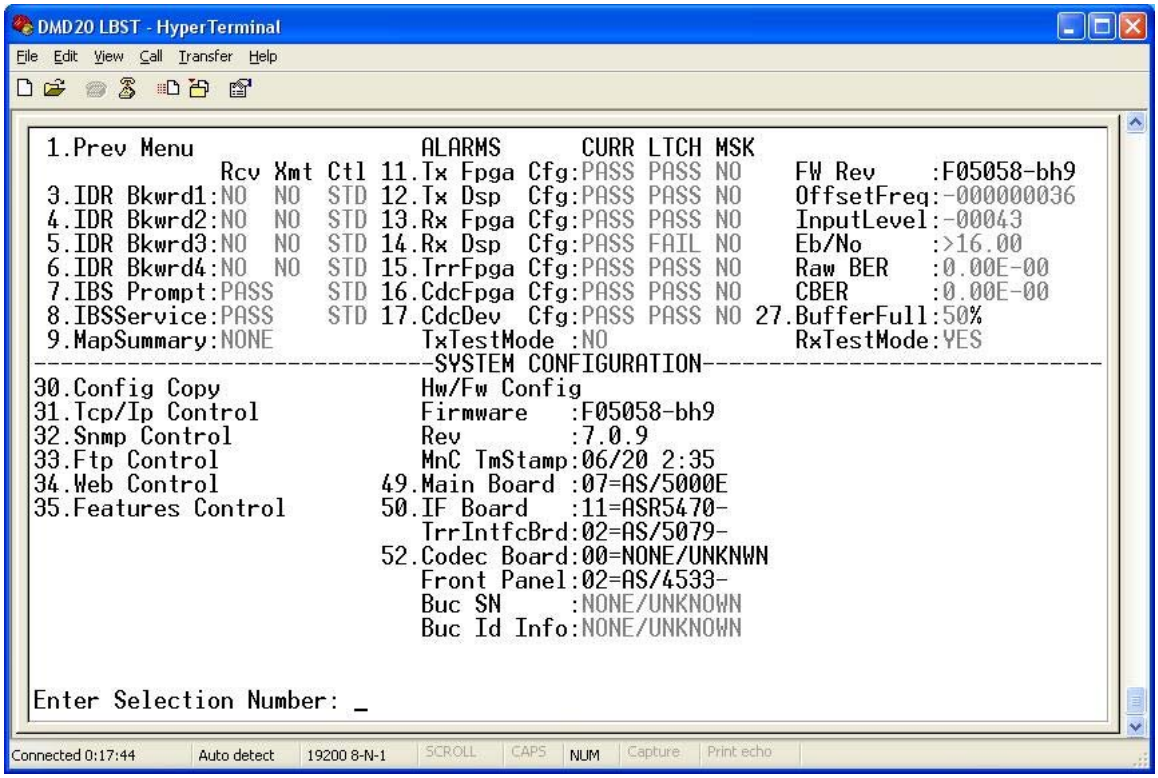
LBST Control:



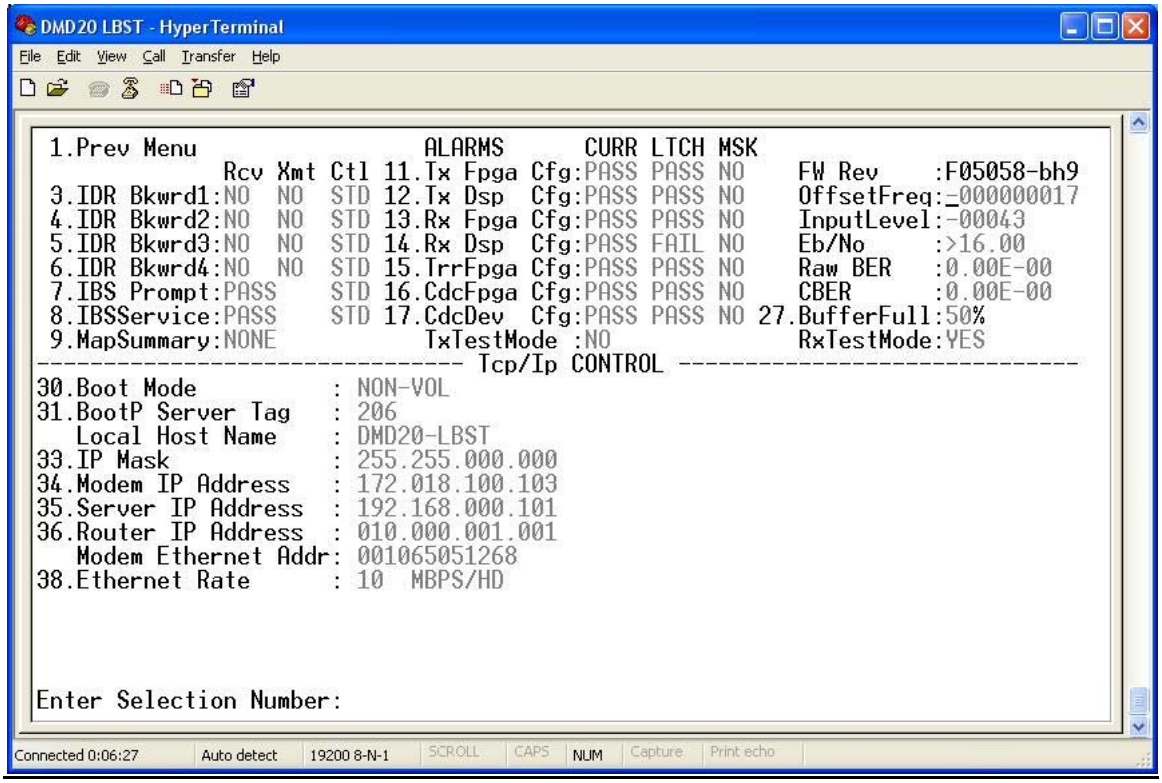
Ethernet Control Screen:



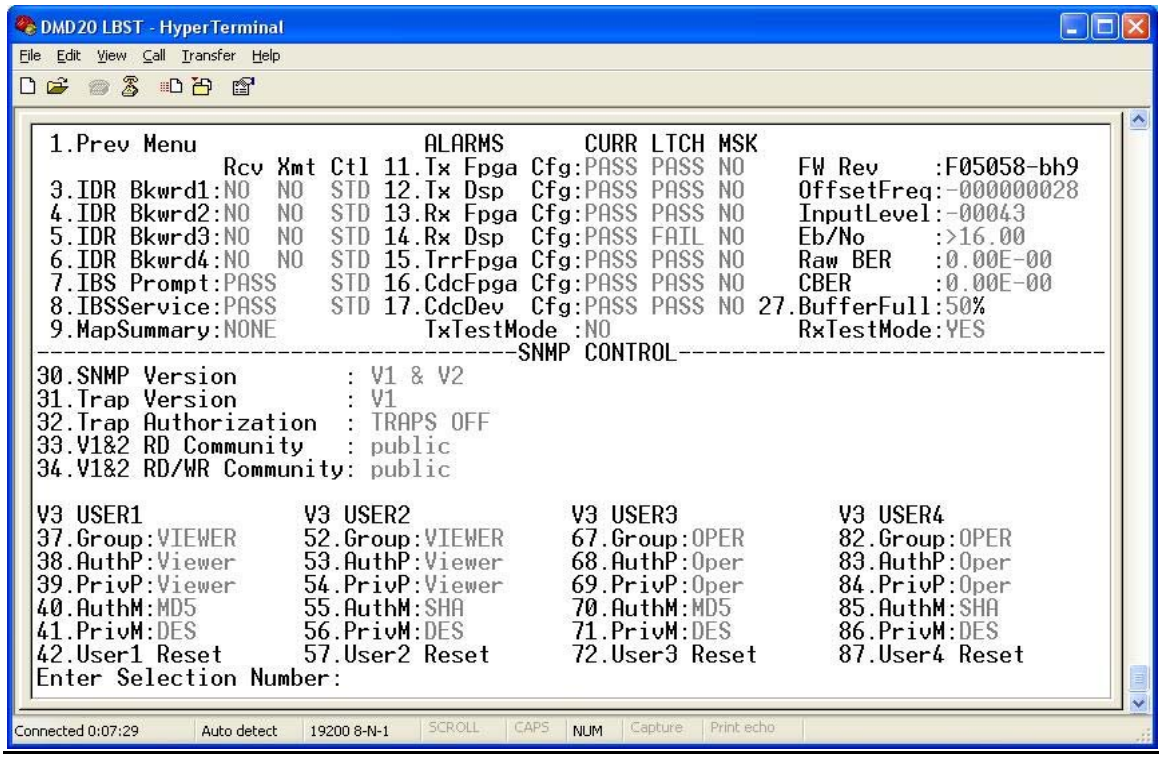
System Configuration Screen:



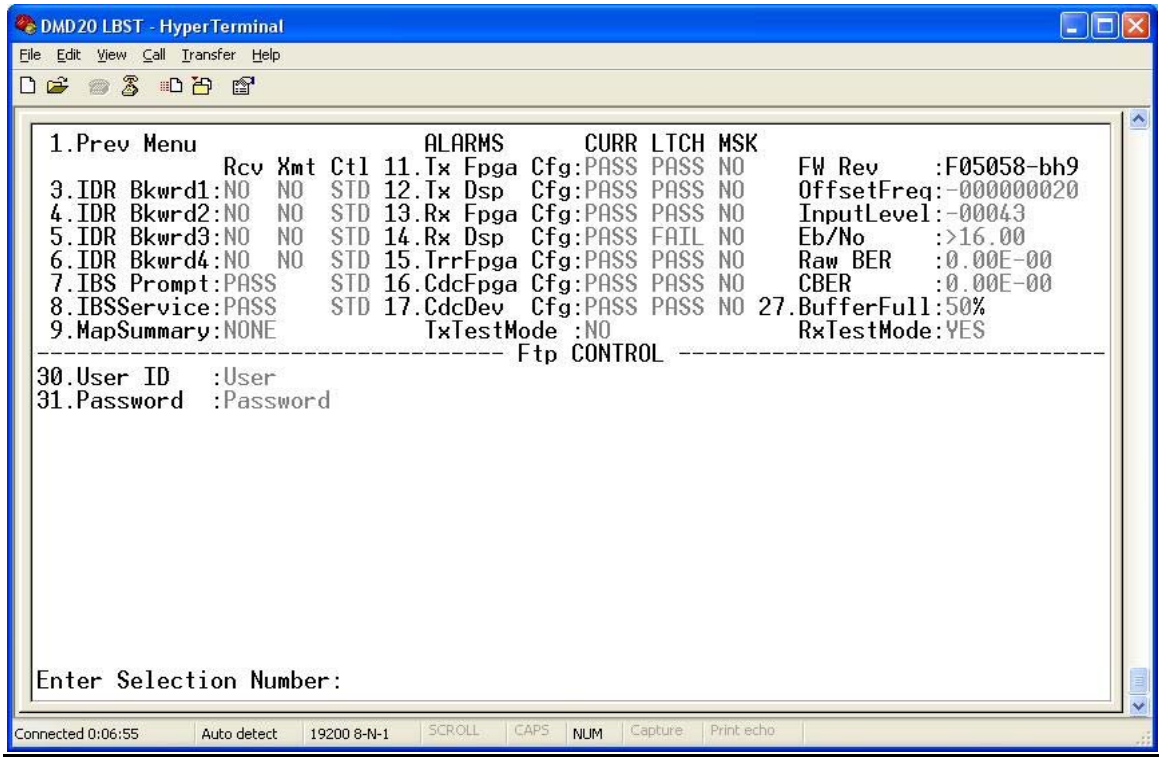
TCP/IP Control Screen:



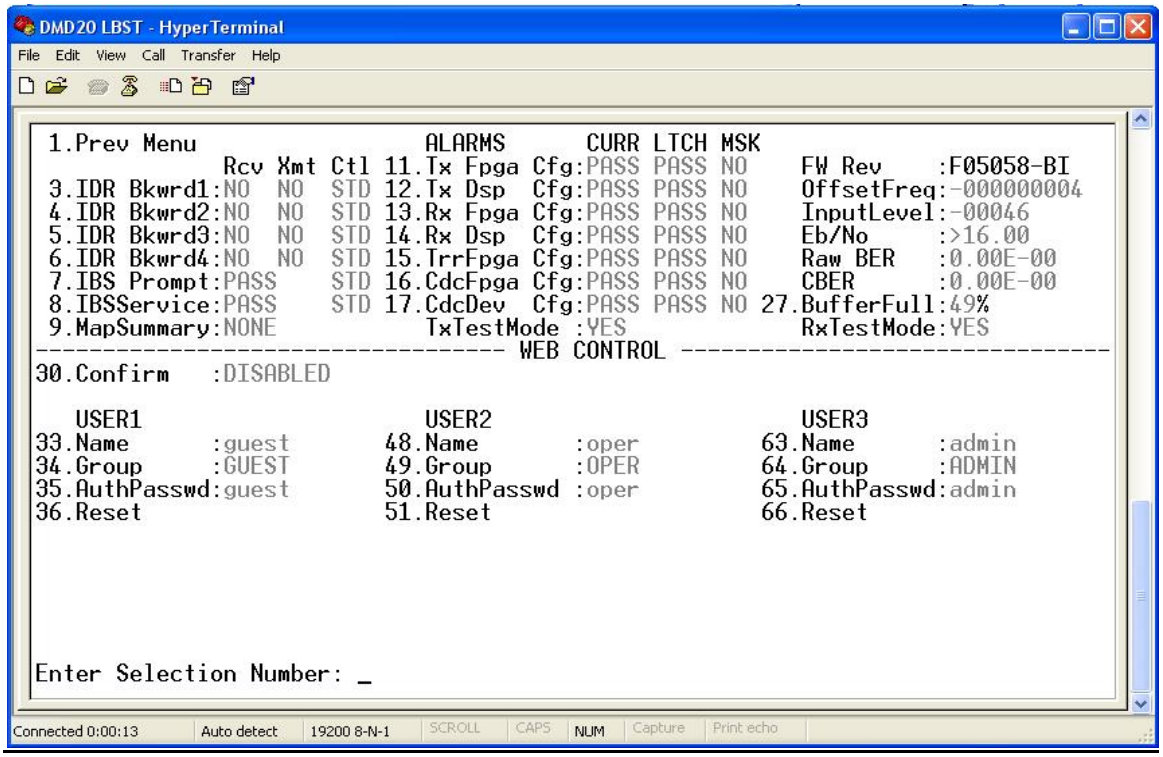
SNMP Control Screen:



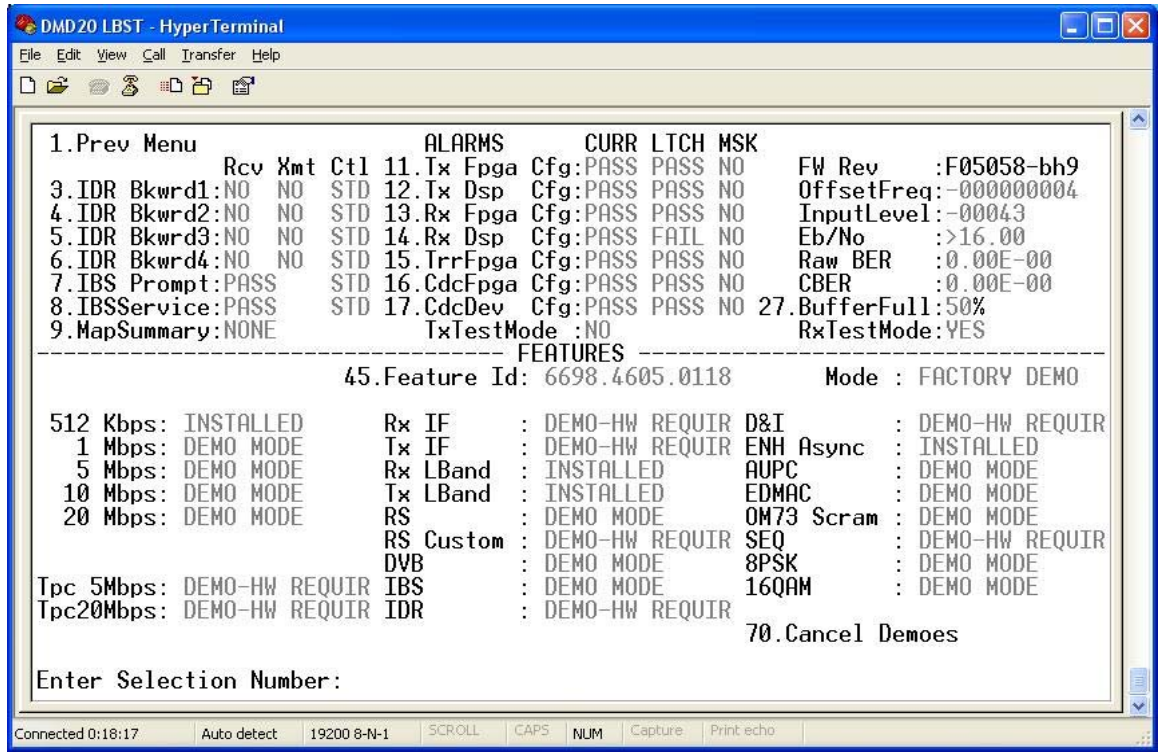
FTP Control Screen:



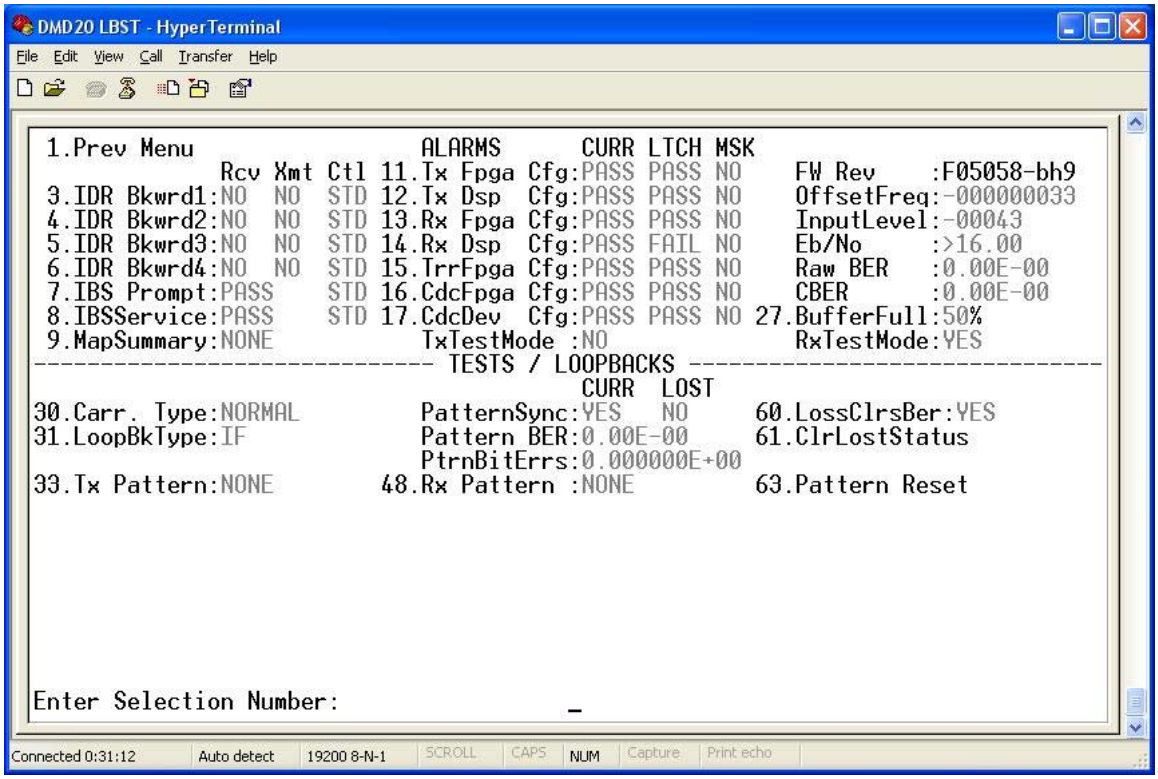
Web Control:



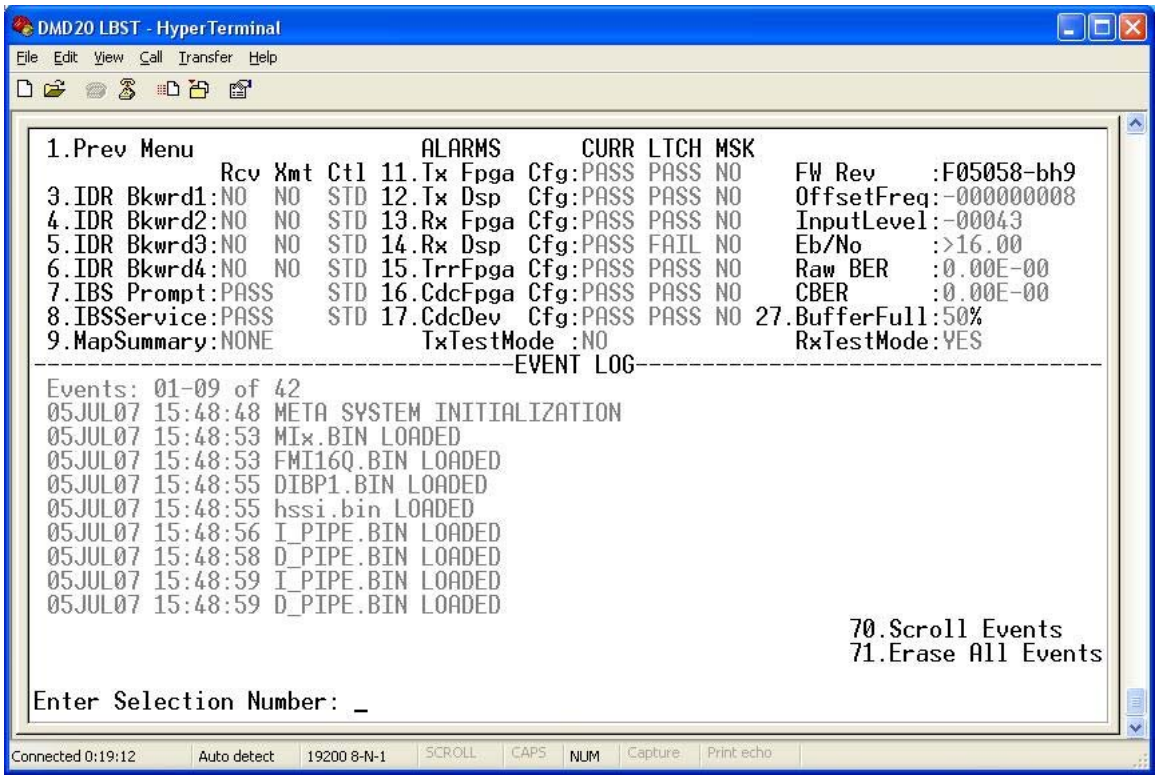
Features Screen:



Tests / Loopbacks Screen:



Event Log Screen:



Notes:

2114 WEST 7TH STREET TEMPE ARIZONA 85281 USA
480 • 333 • 2200 PHONE
480 • 333 • 2161 FAX