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Book Descriptions:

Dmd20 Lbst Manual

The DMD20 also supports FEC Viterbi, ReedSolomon, Sequential, Trellis, Turbo Product Code, Low Density Parity Check Code. With standards including IDR, IBS and DVB, and covering data rates up to 20 Mbps, this 1RU duplex modem covers virtually all your Satellite IP, Telecom, Video and Internet applications. DoubleTalk CarrierinCarrier is complementary to all advances in modem technology, including advanced FEC and modulation techniques. As these technologies approach theoretical limits of power and bandwidth efficiency, DoubleTalk CarrierinCarrier utilizing advanced signal processing techniques provides a new dimension in bandwidth and power efficiency. These options can be purchased and then activated in seconds via the front panel. Additional hardware options like Turbo Product Code TPC, interface expansion, highstability and DC operation complete the modems dynamic feature coverage. This modem can be stocked at its minimum configuration and cost locally for immediate distribution. Then configure onsite, allowing huge savings in time and dollars with justintime feature installation. Additionally, the twoline backlit LCD can be supplemented with terminal software or a standard web browser running on a PC or laptop. The modem presents its entire monitor and control functions on the big screen. Supported by an extensive line of redundancy switches, converters, encoders and decoders, the Radyne DMD20 LBST can be built into any satellite requirement. Compatibility with current modems, such as the DMD2401 and DMD15, are maintained for seamless substitution and addition to your existing systems. From the front panel, a quick status will be displayed, and the most commonly used control parameters can be modified. Suite 15, Melbourne Florida 32904 Sign up for newsletter today. With standards including IDR, IBS and DVB, and covering data rates up to 20 Mbps, this 1RU duplex modem covers virtually all your Satellite IP, Telecom, Video and Internet applications.http://szao-spb.ru/images/news/canon-pixma-mp160-repair-manual.xml

- **dmd20 lbst manual.**

DoubleTalk CarrierinCarrier, based on patented "Adaptive Cancellation" technology, allows transmit and receive carriers of a duplex link to share the same transponder space. DoubleTalk CarrierinCarrier is complementary to all advances in modem technology, including advanced FEC and modulation techniques. As these technologies approach theoretical limits of power and bandwidth efficiency, DoubleTalk CarrierinCarrier utilizing advanced signal processing techniques provides a new dimension in bandwidth and power efficiency. Part Number MNDMD2020LBST Revision 14 2 3 Errata A for MNDMD2020LBST Rev 14 Comtech EF Data Documentation Update Subject Chapter 7, Technical Specifications Errata Part Number ERDMD20LBSEA14 Errata documents are not subject to revision. PLM CO Number C Comments See attached pages. The new information will be included in the next released revision of the manual. The AGC Output Voltage is found on the Alarm connector Pin 14 of J15. Figure 717 AGC Voltage Monitor MNDMD2020LBST Revision ERDMD20LBSEA14 Rev 34 Technical Specifications BLANK PAGE MNDMD2020LBST Revision ERDMD20LBSEA14 Rev 35 Errata B for MNDMD2020LBST Rev 14 Comtech EF Data Documentation Update Subject Chapter 3, Theory of Operation Errata Part Number ERDMD20LBSEB14 Errata documents are not subject to revision. PLM CO Number C Comments The new information will be included in the next released revision of the manual. All rights reserved. F 9 F Change the encoding. F 10 F Install the Internet Explorer Tab V2 addon. F 11 F.6.3 Configure Chrome for the Radyne WEB Browser. F 12 F Change the encoding. F 13 F Install the Internet Explorer Tab for Chrome. F 14 F.6.4 Configure Safari for the Radyne WEB Browser. F 15 F Empty the browser cache. F 16 F Reenter the Modem IP address. F 16 F Change the encoding. F 18 F.6.5

Configure Maxthon for the Radyne WEB Browser. F 19 F Change the browser mode. F 20 F Change the encoding.http://www.annaleehuber.com/content_files/canon-pixma-mp150-manual-espa-ol.xml

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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.

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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. The DMD20 will be referred to in this manual as the standard unit and the DMD20 LBST will be referred to as the LBST. The unit provides selectable functions for different services Intelsat IDR and IBS, DVB, Lowdensity Parity Check Coding LDPC and Closed Networks are supported. The modem operates at all standard IBS and IDR Data Rates up to Mbps. Selection of any data rate is provided over the range of 2.4 Kbps to 20 Mbps in 1 bps steps. For applications requiring system redundancy, the Modem may be used with the Radyne RCS11 11 Redundancy Switch or the RCS20 MN N 54 Introduction The DMD20 LBST Figure 12 offers additional features that are not included in the standard DMD20 Modem. The features included in DMD20 LBST serves as an interface between the indoor unit DMD20 LBST and the outdoor units consisting of the BUC and LNB. The output frequency of the LBST is 950 to 2050 MHz. It does not offer a 70 MHz output that is included in the standard unit. The LBST can supply voltage and 10 MHz reference to the BUC and LNB via the IFL Cable.

The output from the Tx Port consists of the LBand output frequency, highstability 10 MHz reference, FSK communications and either 24 or 48 Volts to the BUC. The Rx Port consists of the LBand input frequency, highstability 10 MHz reference and 13, 15, 18, and 21 volts. In addition, monitoring features provide verification of system status. These can be reviewed from the front panel system menu. Refer to Section 4, User Interfaces for information on how to view these features. Factory installed options are chassis and board configurations that are introduced during manufacturing Feature Upgrades Feature Upgrades are soft upgrades that can be easily be enabled on the modem. Enabling new features are done remotely or through the front panel of the modem. Features may be purchased at any time by contacting a Radyne Corp.A screwdriver is normally the only tool required. Please contact the Radyne Corp. Customer Service Department for information pertaining to availability and to shipping costs. MNDMD2020LBST Revision 55 Introduction IMPORTANT Only authorized service personnel should handle and install optional hardware options Factory Installed Options Units may also be sent to the factory for hardware option installation. Please contact the Customer Service Department for information not limited to availability and to shipping costs. 1.3 Function Accessibility All functions can be accessed through the front panel, terminal or personal computer via a serial link or via the Ethernet port offering a complete remote monitoring and control capability. MNDMD2020LBST Revision 56 Introduction BLANK PAGE MNDMD2020LBST Revision 57 Chapter 2. INSTALLATION 2.1 Unpacking and Inspection Inspect shipping containers for damage. If shipping containers are damaged, keep them until the contents of the shipment have been carefully inspected and checked for normal operation.

The Universal Satellite Modem and its Installation and Operation Manual are packaged and shipped in a preformed, reusable cardboard carton containing foam spacing for maximum shipping protection. This can cause damage to the modem. Note If damage is evident, contact the carrier and Comtech EF Data immediately and submit a damage report. 6 Check the contents against the packing list to verify completeness of the shipment. 7 Refer to the sections that follow for further installation instructions. MNDMD2020LBST Revision 58 Installation 2.2 Installation Requirements The modem is shipped fully assembled. It does not require removal of the covers for any purpose in installation. The power supply itself is designed for universal application using from 100 to 240 VAC, 50 to 60 Hz, 1.0A. WARNING WARNING CAUTION There are no userserviceable parts or configuration settings located inside the Chassis. There is a potential shock hazard internally at the

power supply module. DO NOT open the Chassis under any circumstances. The unit contains a Lithium Battery. DANGER OF EXPLOSION exists if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with local and national regulations. Before initially applying power to the unit, it is a good idea to disconnect the transmit output from the operating ground station equipment. This is especially true if the current configuration settings are unknown, where incorrect settings could disrupt existing communications traffic. MNDMD2020LBST Revision 59 Installation 2.3 Removal and Assembly The Modem is shipped fully assembled. CAUTION Always ensure that power is removed from the before removing or installing any optional modules. Failure to do so may cause damage to the equipment. Carefully unpack the unit and ensure that all of the above items are in the carton.

If the available AC mains power at the installation site requires a different cord set from the one included in the package, then a suitable and approved cord set for the country where the equipment is to be installed will be required before proceeding with the installation. The power supply itself is designed for universal AC application. See specifications for appropriate voltages and currents. 2.4 Mounting Considerations The can be installed within any standard 19 inch equipment cabinet or rack. The unit is a one rack unit RU mounting space 1.75 inches vertically and 19 inches of depth and requires a minimum rack depth of 22 inches for cabling. The rear panel of the DMD50 is designed to have power enter from the left and IF Cabling enter from the right when viewed from the rear of the unit. Data and control cabling can enter from either side based on data interface option. The unit can be placed on a table or suitable surface if required When mounted in an equipment rack, adequate ventilation must be provided. The ambient temperature in the rack should be between 10 and 35 C, and held constant for best equipment operation. The air available to the rack should be clean and relatively dry. The DMD50 units may be stacked one on top of the other up to a maximum of 10 consecutive units before providing one RU of space for airflow. Demodulator units should not be placed immediately above a high heat or EMF generator to ensure the output signal integrity and proper receive operation. Do not mount the in an unprotected outdoor location where there is direct contact with rain, snow, wind or sun. The is designed for indoor applications only. Shielded cables with the shield terminated to the conductive backshells are required in order to meet EMC directives. Cables with insulation flammability ratings of 94 VO or better are required in order to meet low voltage directives. IMPORTANT The unit CANNOT have rack slides mounted to the side of the chassis.

Cooling fans are mounted on the righthand side of the unit. If the unit is to be mounted in a rack, ensure that there is adequate clearance for ventilation, particularly at the sides. In rack systems where there is high heat dissipation, forced air cooling must be provided by top or bottom mounted fans or blowers. Under no circumstance should the highest internal rack temperature be allowed to exceed 50 C 122 F. PROPER GROUNDING PROTECTION REQUIRED The installation instructions require that the integrity of the protective earth must be ensured and that the equipment shall be connected to the protective earth MNDMD2020LBST Revision 60 Installation connection at all times. Therefore, it is imperative during installation, configuration, and operation that the user ensures that the unit has been properly grounded using the ground stud provided on the rear panel of the unit. In Sweden Apparaten skall anslutas till jordat uttag. 2.5 Initial Configuration Check The is shipped from the factory with preset factory defaults. Upon initial powerup, a user check should be performed to verify the shipped modem configuration. Refer to Section 4, User Interfaces to locate and verify that the following configuration settings are correct IMPORTANT Transmit Tx and Receive Rx Interface types are dependent upon the customer s order. IMPORTANT Implementing Strap Code 26 can set the following modem configuration. Refer to Table D1 for an explanation and tabular listing of available Strap Codes. The Frequency and Modulator Output Power are set independently of the strap code. MNDMD2020LBST Revision 62 Installation 2.6 Modulator Checkout The following descriptions assume that the unit is installed in a suitable location with prime AC

power and supporting equipment available Initial PowerUp CAUTION Before initial power up of the unit, it is a good idea to disconnect the transmit output from the operating ground station equipment.

This is especially true if the current Modulator Configuration Settings are unknown, where incorrect settings could disrupt the existing communications traffic. New units from the factory are normally shipped in a default configuration which includes setting the transmit carrier off. Turn on the unit by placing the Rear Panel Switch located above the power entry connector to the On Position. These powerup diagnostics show no results if successful. If a failure is detected, the Fault LED will illuminate. The initial field checkout of the modem can be accomplished from the Front Panel or in the Terminal Mode. The Terminal Mode has the advantage of providing full screen access to all of the modem s parameters, but requires a separate terminal or computer running a Terminal Program. The optional printed circuit cards include a Turbo Codec printed circuit card and one of several types of Interface printed circuit card refer to Appendix A. In the complex downconverter, the signal for demodulation is amplified and sent through a variable wideband attenuator for AGC. The gaincontrolled signal is then passed through a complex downconverter to a low IF. Figure 32 IF Card Block Diagram MNDMD2020LBST Revision 65 Theory of Operation Baseband Processing Printed Circuit Card The advent of millionplus gate count FPGAs, advanced logic synthesis tools, and DSPs providing hundreds of MIPs enabled the design of a software configurable modem. Large, fast FPGAs now provide designers with what is essentially an on the fly programmable ASIC. High speed, complex digital logic functions that previously could only be implemented in dedicated integrated circuits are now downloaded from a microcontroller through a serial or peripheral interface. When a new digital logic function is needed, a new configuration file is loaded into the FPGA.

There is no limit to the number of digital logic configurations available to the FPGA, aside from the amount of Flash memory available to the system microprocessor for storage of configuration files. Also included on the Baseband Printed Circuit Card are three synchronous interfaces, an EIA530 Interface supporting RS422, V.35, and RS232. All three interfaces are provided on the same DB25 Connector, and are selectable from the front panel. Communication to the outside world is done via connections to the remote port, terminal port, Ethernet port, and alarm ports. The memory can be reprogrammed via the Ethernet port to facilitate changes in software Enhanced Interface Printed Circuit Card The normal terrestrial data for the Baseband Processing Card can be rerouted to the enhanced interface card. The enhanced interface card adds a variety of connections to the modem for additional applications 3.2 Functional Block Diagram Figure 33 represents the Functional Blocks. A multiplexer is also provided for the SCT Clock Source for Loop Timing Applications. The transmit and receive paths may be configured independently under processor control. The Drop Processor extracts the desired time slots from the terrestrial data stream and feeds these channels back to the framer. The framer then places the dropped terrestrial time slots into the desired satellite channel slots. The data is then sent to the ReedSolomon Encoder. When enabled, the ReedSolomon Encoder, encodes the data into ReedSolomon Blocks. The blocks are then interleaved and synchronized to the frame pattern as defined by the selected specification IESS308, IESS309, DVB, etc.. After ReedSolomon Encoding, the composite data and clock are applied to the BB Loopback Circuit Rx Baseband Processing The Receive Processor performs the inverse function of the Tx Processor. Data received from the satellite passes through the BB Loopback Circuit to the ReedSolomon Decoder to the Deframer.

The data is extracted from the buffer and is sent to the UIM. These connections provide status on the working condition of the circuitry as well as providing the data required for the various measurements the modem provides. Detailed status information is available via the modems various user interfaces including the remote and terminal ports. During each poll cycle, the status of each of the subsystems is collected and reported to each of the external ports. This function is front panel

selectable. 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 VT100 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 RS232 operating parameters can be set using the modem Front Panel and stored in Nonvolatile memory for future use. Refer to the Remote Protocol Manual MNDMDREMOTEOP for the Terminal, Remote and SNMP screens and protocols Modem Remote Communications RLLP The Remote Port located on J20 allows for control and monitoring of parameters and functions via an RS232 Serial Interface, or RS485 for RLLP Protocol. Equipment Remote Mode setup can be entered from the front panel or the Web Browser interface under the System menu. This requires the user to first set the Remote Port Control to Remote then set the Multidrop Address as needed followed by setting the Remote Interface to RS232 or RS485. 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. The port is configured for 10 BaseT communications protocols. Refer to Appendix E and F for proper setup of the TCPIP interface and Web Browser Setup.

Detailed status information is available via the modems various user interfaces front panel, remote and terminal. Mod Fault Demod Fault Common Fault Deenergized when any transmit side fault is detected. Deenergized when any receive side fault is detected. Mod Fault Demod Fault Will sink up to 20 ma maximum until a transmit or common fault is detected. Will not sink current if a fault is detected. Will sink up to 20 ma maximum until a receive or common fault is detected. The baud rate and protocol can be selected from the Front Panel. The port may be configured for a number of communications protocols. This port is also used by SCC Framing for the inband data. 3.5 Internal Clock The time and date is kept in order to timetag system events. User can change the Internal Clock via the front panel, Web Browser or Terminal ports. In order to run any type of data test with an Ethernet interface you must utilize two modems connected back to back. Simply using one modem and a loopback will not produce the desired results. MNDMD2020LBST Revision 71 Theory of Operation Figure 34 Loopback Functional Block Diagram MNDMD2020LBST Revision 72 Theory of Operation Figure 35 Loopback Functional Block Diagram Figure 36 Loopback Functional Block Diagram MNDMD2020LBST Revision 73 Theory of Operation 3.7 Clocking Options The modem supports a number of different clocking options that can be recovered from the satellite or the terrestrial links. The various clocking options allow users to determine which clock will best fit their applications. Figure 37 gives an overview on how the modem processes the various clocks for the Tx Clock source and the Rx Buffer Clock source. Tx and Rx Clocks may be independently locked. The allows users to select SCTE Clock Terrestrial or the SCT internal clock. The modem also allows user to recover the SCT Clock from the satellite SCR or from the modem internally. The modem allows users to select clock polarity.

The Tx clock selections available are MNDMD2020LBST Revision 74 Theory of Operation The following paragraphs define the types of clocking options available to the user at the Front Panel. SCT Internal Oscillator SCTE External Tx Terrestrial Clock Rx Satellite Clock SCTE Serial Clock Transmit External The SCTE clock is the Transmit Terrestrial Clock associated with the data interface. SCTE is an external clock received from the terrestrial equipment and the modem utilizes the terrestrial clock to lock the internal clock. In Figure 37, the Transmit Terrestrial Data enters the modem and is clocked into a dejitter FIFO. Data is clocked out of the FIFO by the Modulator Clock. The Modulator Clock and PhaseLocked Loop PLL, in conjunction with the Dejitter FIFO, which reduces the input jitter. Jitter reduction exceeds the jitter transfer specified in CCITT G.821. SCTE is sometimes referred to as Tx Terrestrial Timing or Terminal Timing. Terminal Timing is reference to the RS422 synchronous interfaces SCT Serial Clock Transmit The SCT clock can be generated internally or recovered from the satellite. The SCT clock source can be used as the TX clock source,

RX Buffer Clock source and the Terrestrial Terminal equipment for clocking the transmit data. If the SCT clock is recovered from the satellite, then it is referred to as SCR. SCR is also referred to as Receive Clock, Satellite Clock, or Receive Timing RT. When SCT clock is configured as Internal, the frequency of the clock is set the same as the Transmit Terrestrial Clock rate. If SCT clock is configured as SCR, the internal clock is set to the same rate as the incoming receive satellite clock. SCT is sometimes referred to as Internal Timing or Send Timing ST. In the event that the satellite clock is lost, the modem will automatically switch over to the Internal Clock and revert back to SCR when activity is detected.

If SCT is selected, then Terrestrial data that is synchronous to the SCT Clock is required to be supplied by the modem. It is intended for the terminal equipment to use the SCT as its clock source. The Autophase Circuit will automatically ensure that the data is clocked correctly into the modem. Therefore, a return clock is not necessary. The Clock Polarity should be set to Auto RX Buffer Clock Options The modem supports a number of RX Buffer clock options that can be recovered from the satellite, terrestrial links, internally or externally. Figure 37 gives an overview on how the modem processes the various clocks for the Tx Clock and the Rx Buffer Clock. The modem allows users to select clock polarity Tx and Rx Clocks may be independently locked. The user assigns priorities to the clock sources based on source selections. Source 1 has the highest priority and Source 5 being the last resort or lowest priority. If a fallback clock is selected and activity is lost at the highest priority source, the modem will fall back to the next highest priority clock with activity. When activity resumes on a higher priority source, the modem resumes using the higher priority source Clock Source Priority RX SAT 1 of 5 SCTE 2 of 5 SCT 3 of 5 EXC BNC 4 of 5 EXT IDI 5 of 5 Refer to Front panel setup menus or Web Browser manual MNDMDREMOTEOP RX SAT Clock The RX Sat clock is recovered from the satellite that is received from the distant end. If selected the Buffer Clock is lock to the RX sat clock CTE Serial Clock Transmit External When SCTE is selected as the Rx Buffer clock, the modem receives the clock from the Transmit Terrestrial interface SCT Serial Clock Transmit If SCT clock is selected as the RX Buffer clock source, then it should be configured for internal. This is a 75ohm unbalanced BNC connector. This clock source is also identified as EXT BNC. The External Clock is often used as the station master clock.

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