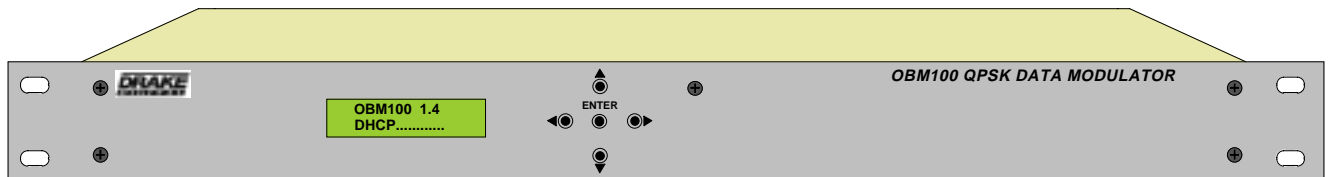




OBM100 QPSK Data Modulator

Instruction Manual



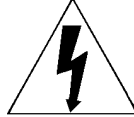
2 Caution Statements

WARNING: TO PREVENT FIRE OR ELECTRICAL SHOCK DO NOT EXPOSE TO RAIN OR MOISTURE

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL		



A product and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the product and cart combination to overturn.



The lightning flash with arrow head symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.
DO NOT OPEN THE CABINET, REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

CAUTION: TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PREVENIR LES CHOCS ELECTRIQUES, NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

Important Safety Instructions 3

Consignes importantes de sécurité 3

1. Read Instructions—All the safety and operating Instructions should be read before the product is operated.

1a. Lire les directives - Toutes les directives de sécurité et d'utilisation devraient être lues avant de mettre l'appareil en opération.

2. Retain Instructions—The safety and operating instructions should be retained for future reference.

2a. Conserver les directives - Les directives de sécurité et d'utilisation devraient être conservées pour consultation future.

3. Heed Warnings—All warnings on the product and in the operating instructions should be adhered to.

3a. Tenir compte des avertissements - Tous les avertissements apparaissant sur l'appareil et dans les consignes d'utilisation devraient être respectés.

4. Follow instructions - All operating and use instructions should be followed.

4a. Suivre les directives - Toutes les directives d'opération et d'utilisation devraient être suivies.

5. Cleaning—Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleansers. Use a damp cloth for cleaning.

5a. Nettoyage - Débrancher l'appareil de la prise électrique murale avant le nettoyage. Ne pas utiliser de nettoyeurs liquides ou aérosols. Employer un linge humide pour le nettoyage.

6. Attachments—Do not use attachments that are not recommended by the product manufacturer as they may cause hazards.

6a. Fixation - Ne pas utiliser d'autres fixations que celles recommandées par le fabricant; elles pourraient être source de dangers.

7. Water and Moisture—Do not use this product near water—for example, near a bathtub, wash bowl, kitchen sink or laundry tub; in a wet basement; or near a swimming pool; and the like.

7a. Eau et humidité - Ne pas utiliser cet appareil près de l'eau. Par exemple, près d'une baignoire, d'un bac de lavage, d'un évier de cuisine ou d'une cuvette de lessivage; dans un sous-sol humide; ou à proximité d'une piscine; et autres environnements similaires.

8. Accessories—Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

8a. Accessoires - Ne pas installer cet appareil sur un chariot, un socle, un trépied, un support ou une table instables. L'appareil pourrait tomber, entraînant des blessures graves à un enfant ou à un adulte, et des dommages importants à l'appareil. Employer seulement avec un chariot, un socle, un trépied, un support, ou une table recommandés par le fabricant ou vendu avec l'appareil. Toute installation de l'appareil devrait être conforme aux directives du fabricant et devrait utiliser des accessoires d'installation recommandés par celui-ci.

9. A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

9a. Un chariot supportant l'appareil devrait être déplacé avec précaution. Les arrêts brusques, la force excessive et les surfaces inégales peuvent renverser le chariot.

10. Ventilation—Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should not be placed in a built-in installation such as bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

10a. Ventilation - Des fentes et ouvertures dans le châssis sont prévues pour la ventilation de l'appareil, pour en assurer la fiabilité d'opération et le protéger contre la surchauffe. Ces ouvertures ne doivent pas être bloquées ou recouvertes. Ces ouvertures ne devraient jamais être bloquées en plaçant l'appareil sur un lit, un sofa, une couverture, ou une surface semblable. Cet appareil ne devrait pas être installé dans un meuble encastré comme une bibliothèque ou une étagère à moins de lui fournir une ventilation adéquate ou que l'installation soit conforme aux directives du fabricant.

11. Power Sources—This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

11a. Sources d'alimentation électrique - Cet appareil devrait être utilisé seulement avec le type d'alimentation électrique inscrite sur l'étiquette. Si vous n'êtes pas certain du type d'alimentation électrique fourni à votre maison, consultez le vendeur de l'appareil ou l'entreprises d'énergie locale. Pour des appareils alimentés par une batterie ou d'autres sources, se référer aux consignes d'utilisation.

12. Grounding or Polarization—This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other) This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. Alternate Warnings—If this product is equipped with a three-wire grounding-type plug, a plug having a third (grounding) pin, the plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

12a. Mise à la terre ou polarisation - Cet appareil peut être équipé d'une fiche électrique de courant alternatif polarisée (une fiche ayant une lame plus large que l'autre). Cette fiche ne s'insérera correctement dans la prise de courant que d'une seule façon; c'est un dispositif de sécurité. S'il est impossible d'insérer la fiche entièrement dans la prise de courant, essayer de renverser la fiche. Si la fiche ne s'insère toujours pas, contacter un électricien pour remplacer la prise de courant désuète. Ne pas altérer le dispositif de sécurité de la fiche polarisée.

Mise en garde supplémentaire - Si cet appareil est équipé d'une fiche électrique à trois broches (une fiche ayant une broche de mise à la terre), la fiche s'insérera seulement dans une prise de courant équipée d'une mise à la terre; c'est un dispositif de sécurité. S'il est impossible d'insérer la fiche dans la prise de courant, contacter un électricien pour remplacer la prise de courant désuète. Ne pas altérer le dispositif de sécurité de la fiche avec mise à la terre.

13. Power-Cord Protection—Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

13a. Protection du cordon d'alimentation - Les cordons d'alimentation devraient être disposés de façon à ce qu'on ne puisse marcher dessus ou qu'ils soient susceptibles d'être coincés par des articles placés sur ou contre eux. Une attention particulière doit être portée aux fiches, prises de courant, et aux points où ils sortent de l'appareil.

14. Outdoor Antenna Grounding—If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.

14a. Mise à la terre de l'antenne extérieure - Si un système extérieur d'antenne ou de câble est relié à l'appareil, s'assurer que le système d'antenne ou de câble est muni d'une mise à la terre afin de fournir une certaine protection contre les surtensions et les charges d'électricité statique. L'article 810 du code électrique national, ANSI/NFPA 70, fournit l'information nécessaire en ce qui concerne la mise à la terre appropriée du mât et de la structure porteuse, la mise à la terre du câble de connexion à une unité de décharge d'antenne, le calibre des conducteurs de mise à la terre, la location de l'unité de décharge d'antenne, le raccordement aux électrodes de mise à la terre et les spécifications pour les électrodes de mise à la terre. Voir la figure A.

15. Lightning—For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

15a. Foudre - Pour une protection supplémentaire de cet appareil pendant un orage électrique, ou quand il est laissé sans surveillance et inutilisé pendant de longues périodes, le débrancher de la prise électrique murale et déconnecter le système d'antenne ou de câble. Ceci préviendra les dommages à l'appareil dus à la foudre et aux surtensions.

16. Power Lines—An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.

16a. Lignes électriques - Un système d'antenne extérieur ne devrait pas être situé à proximité de lignes électriques aériennes ou de tout autre circuit électrique, où il pourrait tomber sur de tels circuits ou lignes électriques. Lors de l'installation d'un système d'antenne extérieur, d'extrêmes précautions devraient être prises afin de prévenir tout contact avec des lignes ou circuits électriques. Entrer en contact avec de tels circuits ou lignes électriques pourrait être fatal.

17. Overloading—Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

17a. Surcharge - Ne pas surcharger les prises de courant murales, les rallonges électriques ou les prises de courant intégrées. Un risque d'incendie ou de choc électrique pourrait résulter d'une telle surcharge.

4 Important Safety Instructions (cont.)

4 Consignes importantes de sécurité

18. Object and Liquid Entry—Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

18a. Insertion d'objet ou de liquide – Ne jamais insérer d'objet par les ouvertures de cet appareil. Il pourrait toucher des points de voltage dangereux ou court-circuiter des pièces, ce qui pourrait résulter en incendie ou en choc électrique. Ne jamais verser de liquide sur l'appareil.

19. Servicing—Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19a. Entretien – Ne pas essayer de faire soi-même l'entretien de cet appareil. En ouvrir ou en retirer les couvercles pourrait vous exposer à des voltages dangereux ou à d'autres dangers. Confier tout entretien à un personnel de service qualifié.

20. Damage Requiring Service—Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power-supply cord or plug is damaged,
- If liquid has been spilled, or objects have fallen into the product,
- If the product has been exposed to rain or water,
- If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation,
- If the product has been dropped or damaged in anyway, and
- When the product exhibits a distinct change in performance—this indicates a need for service.

20a. Dommage exigeant un entretien - Débrancher cet appareil de la prise de courant électrique et confier l'entretien au personnel de service qualifié dans les éventualités suivantes:

- Quand le cordon d'alimentation ou sa fiche sont endommagés,
- Si des objets sont tombés dans l'appareil, ou si du liquide y a été renversé,
- Si l'appareil a été exposé à la pluie ou à l'eau,
- Si l'appareil ne fonctionne pas normalement en suivant les consignes d'utilisation.

Ajuster seulement les commandes qui sont mentionnées dans le guide d'opération. Un mauvais ajustement des autres commandes pourrait causer des dommages à l'appareil et souvent exiger un travail supplémentaire de la part d'un technicien qualifié pour remettre l'appareil en état normal d'opération.

e. Si l'appareil a été échappé ou endommagé de n'importe quelle façon, et **f.** Quand l'appareil montre un changement notable de performance – ceci indique qu'un entretien est nécessaire.

21. Replacement Parts—When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutes may result in fire, electric shock or other hazards.

21a. Pièces de rechange - Si des pièces de rechange sont nécessaires, s'assurer que le technicien de service a employé des pièces de rechange spécifiques du manufacturier ou ayant les mêmes caractéristiques que les pièces originales. L'utilisation de pièces de rechange non autorisées pourrait résulter en incendie, choc électrique ou autres dangers.

22. Safety Check—Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

22a. Vérification de sécurité – À la suite de toute réparation ou entretien de cet appareil, demander au technicien de service d'exécuter des vérifications de sécurité afin de s'assurer que l'appareil est en condition normale de fonctionnement.

23. Wall or Ceiling Mounting—The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

23a. Montage au mur ou au plafond - L'appareil ne devrait être monté au mur ou au plafond qu'uniquement de la façon recommandée par le manufacturier.

24. Heat—The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

24a. Chaleur – L'appareil devrait être situé loin de sources de chaleur telles que des radiateurs, des registres de chaleur, des fourneaux, ou d'autres appareils (y compris amplificateurs) produisant de la chaleur.

Figure A

Example of antenna grounding as per National Electrical Code, ANSI/NFPA 70

Exemple de mise à la terre d'antenne selon le code électrique national, ANSI/NFPA 70

NOTE TO CATV SYSTEM INSTALLERS:

THIS REMINDER IS PROVIDED TO CALL THE CATV SYSTEM INSTALLER'S ATTENTION TO ARTICLE 820 - 40 OF THE NEC THAT PROVIDES GUIDELINES FOR PROPER GROUNDING AND, IN PARTICULAR, SPECIFIES THAT THE CABLE GROUND SHALL BE CONNECTED TO THE GROUNDING SYSTEM OF THE BUILDING, AS CLOSE TO THE POINT OF CABLE ENTRY AS PRACTICAL.

NOTE AUX INSTALLATEURS DE SYSTÈME DE CATV :

CE RAPPEL EST FOURNI POUR PORTER À L'ATTENTION DES INSTALLATEURS DE SYSTÈME DE CATV, L'ARTICLE 820 - 40 DU NEC QUI DONNE DES DIRECTIVES POUR UNE MISE À LA TERRE APPROPRIÉE ET, EN PARTICULIER, SPÉCIFIE QUE LE CÂBLE DE MISE À LA TERRE DEVRAIT ÊTRE RACCORDÉ AU SYSTÈME DE MISE À LA TERRE DU BÂTIMENT LE PLUS PRÈS POSSIBLE DE L'ENTRÉE DU CÂBLE.

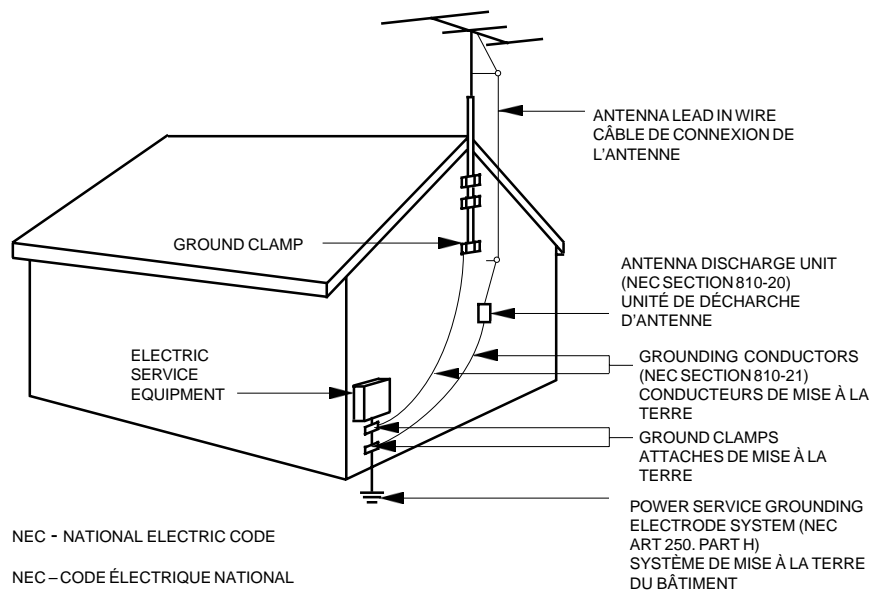


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SPECIFICATIONS

QPSK OUTPUT

Frequency Range: 70 MHz to 130 MHz, 50 kHz step
Output Level: +50 dBmV minimum
Output Level Adjustment Range: 20 dB typical
Output Level Display Accuracy: ± 2 dB
Output Level Stability: ± 1 dB
Frequency Stability: ± 5 Hz
Output Impedance: 75 ohm, return loss > 12 dB
Mode: Normal, CW, PRBS
Symbol Rate: .772 MHz, 1.024 MHz, 1.544 MHz
FEC: SCTE 5501

ASI INPUTS

Four ASI Inputs: 270 MHz Clock Speed, BNC Connectors
Data Rate: 3.02 Mbps Maximum for Total of All Four Inputs

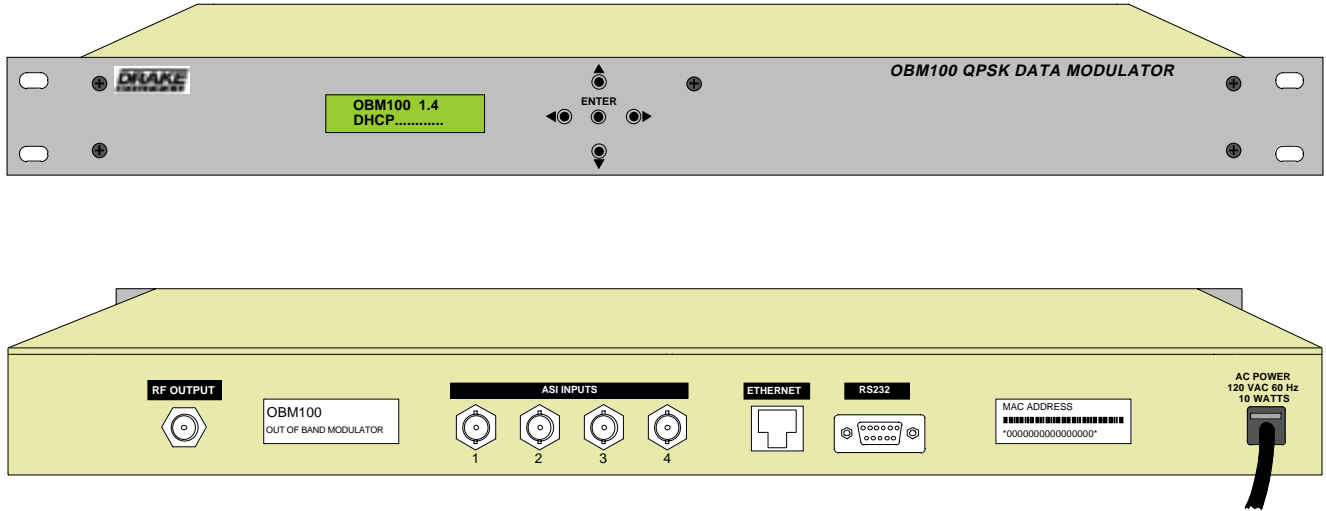
ETHERNET INPUT

UDP to UDP Frame Spacing: 3500 microseconds minimum for 1.544 MHz Symbol Rate
UDP to UDP Frame Spacing: 5300 microseconds minimum for 1.024 MHz Symbol Rate
UDP to UDP Frame Spacing: 7050 microseconds minimum for .772 MHz Symbol Rate

GENERAL

Operating Temperature Range: 0 C to +50 C ambient
Size: 19" W x 1.75" H x 7.75" D
Weight: 5 pounds
Power Requirements: 120 VAC / 60 Hz / 10 W

6 General Description / Installation and Mounting



OBM100 DESCRIPTION

The OBM100 is an out of band data modulator for use with the SCT2X4 headend satellite to cable transcoder. The purpose of the OBM100 is to provide a one way data channel from the headend to a universe of set top boxes that are being served by the headend. Usually program guide and conditional access control information will be sent through this channel.

The OBM100 provides two functions in the data management process. First of all it accepts an ASI transport stream from the SCT2X4 data output connector. This is data that is sent over the satellite path to the headend. The OBM100 takes this low data rate stream and without making any changes to the data, outputs the data through an Ethernet connection to the headend control PC.

After the headend PC constructs a complete data stream for the set tops, derived from the satellite delivered data and from locally generated data, the resulting stream is output from the headend control PC back to the OBM100 on the same Ethernet cable that is passing the satellite delivered data in the other direction. The OBM100 accepts this incoming data and performs its second function – transmitting this data stream to the set top boxes.

The OBM100 generates a QPSK modulated signal, modulated by the data stream from the headend controller, at a data rate of approximately 3 Mbps. This signal is upconverted to any operator selected frequency between 70 and 130 MHz for transmission throughout the cable plant.

INSTALLATION AND MOUNTING NOTES

This equipment is designed to be installed in a standard 19" rack. When the unit is mounted above or below other rack mounted equipment, a 1U space (1.75") should be left between the unit and the other equipment to allow ambient air flow between the units.

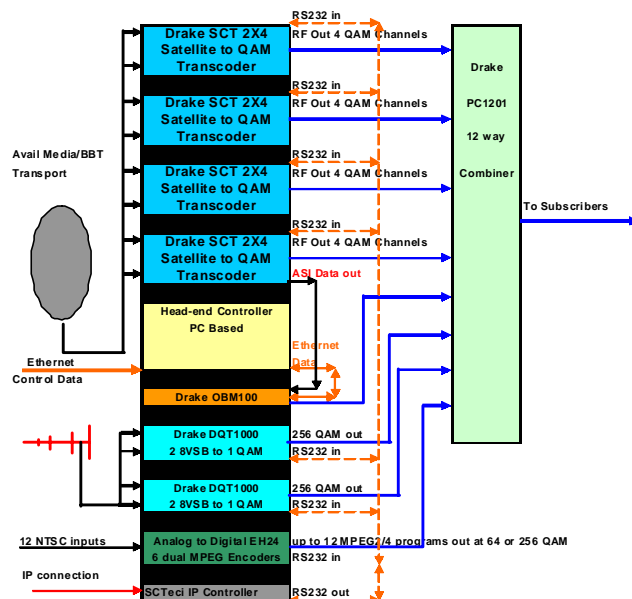
Connect a cable from the OBM100 Ethernet connector to the Ethernet connector on the PC based headend controller.

Connect each of the four ASI INPUT connectors of the OBM100 to the ASI DATA connectors of the Drake SCT2x4 Transcoders in the system.

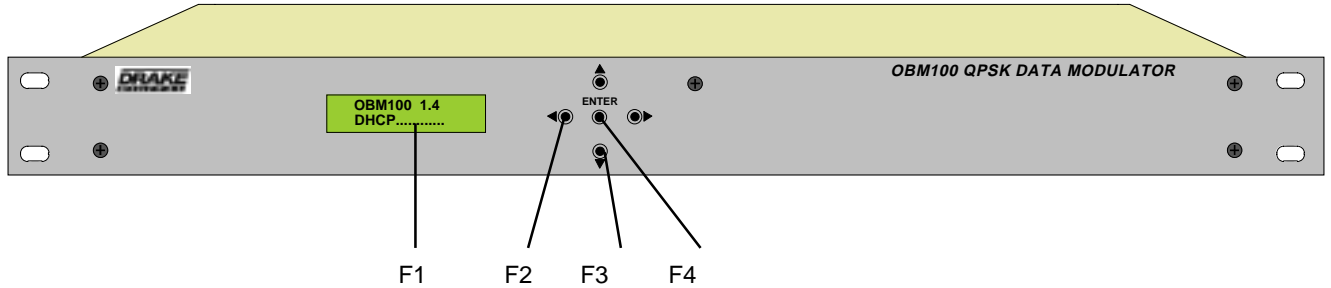
Connect the OBM100 RF OUTPUT connector to the output combiner which sends downstream RF.

Connect the AC line cord to an appropriate source of 120 volt, 60 Hz AC power. The OBM100 is always on once the AC power cord is connected to its power source.

TYPICAL Drake BBT HEADEND INSTALLATION



FRONT PANEL CONTROLS



F1, LCD Display – This display presents the selected menu screen and the parameter settings. The backlight in the display is on when power is applied.

When not in adjust mode the firmware version number is displayed on the top line, and the unit's IP address, if programmed, is displayed on the bottom line. If DHCP has been enabled but the unit has not been connected to an appropriate DHCP enabled PC based controller, "DHCP....." will be displayed instead of an IP address.

Pressing the UP or DOWN buttons cycles the display through the firmware version screen, the data rate screens, and the MAC number screen.

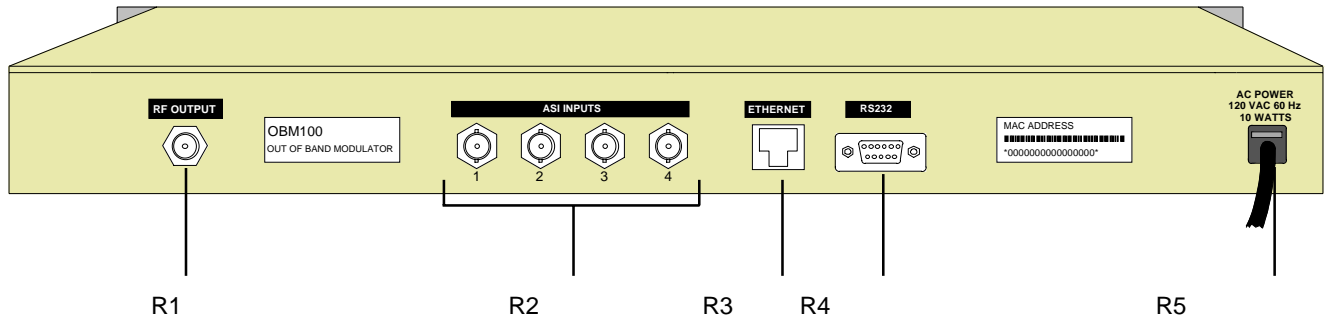
F2, ◀ Left and ▶ Right Buttons – Use the LEFT and RIGHT arrow buttons to navigate from screen to screen to view a parameter setting. These buttons are operational in the normal mode or the adjust mode. Using only these

buttons will not change any parameter setting.

F3, ▲ Up and ▼ Down Buttons – Use the up and down arrow buttons to change the value of a viewed parameter setting. The unit must be in the adjust mode in order for these buttons to become active for changing a parameter setting.

F4, ENTER Button - Use the ENTER button to enter the adjust mode or to save and load a new setting or settings after adjustment. Hold for approximately 2 seconds until a flashing "▲" appears in the upper right hand corner of the display to enter the adjust mode. After entering the adjust mode, momentarily pressing the ENTER button again will load and save any settings that may have been changed using the UP and DOWN buttons, and will exit the adjust mode. Note that the adjust mode cannot be entered from the firmware version number or MAC number screens.

REAR PANEL CONNECTIONS



R1, RF OUTPUT – This type "F" connector is the high level (+52 dBmV), 70 to 129.95 MHz, output from the OBM100 upconverter section.

R2, ASI INPUTS - These four BNC type connectors accept ASI transport streams from the data output connectors of up to four SCT2x4 Transcoders.

R3, ETHERNET - This Ethernet connector provides two way communication between the OBM100 and a PC based headend controller. It is recommended that the headend controller has a separate Ethernet card so that a crossover cable can be used to connect directly to the OBM100.

If a network connection is used, the OBM100 must be connected to a firewall device that restricts the Ethernet communications to be only Ethernet frames to and from the headend controller.

R4, RS232 - This DB9 serial connector is for factory use only.

R5, AC Line Cord – For connection to the nominal 120 VAC power source. This unit is designed for use in countries with 120 VAC power standards with a power line frequency of 60 Hz. The maximum power consumption is 10 watts.

8 Setup and Programming / Software Flow Chart

GENERAL

Programming and viewing of the various setup and operating parameters are accomplished using the front panel back lit, two line, sixteen character wide LCD along with the LEFT, RIGHT, UP, DOWN and ENTER buttons. Generally, the name of the parameter is on the top line of the display and the setting value is on the bottom line. For some parameters, both the parameter name and value are on the bottom line.

To observe a certain parameter setting without intending to change its value, just use the LEFT and RIGHT arrow buttons to navigate through the menus shown in the software flow chart below. Generally, the current setting for each parameter is shown on the bottom line of the display. Note that depending upon certain settings, some screens are not needed and will be skipped.

To make a change in the displayed parameter and its setting and if this is the initial setup, you will want to enter the 'adjust' mode. To do this, press the ENTER button that is located in the center of the four arrow buttons and hold in for several seconds until a flashing "▲" appears in the upper right hand corner of the display. After you are in the adjust mode, use the LEFT and RIGHT arrow buttons to navigate among screens and use the UP and DOWN arrows to change the parameter setting.

When certain numerical values are to be adjusted, one or more asterisks (*) will appear above the digits to be adjusted. Use the UP and DOWN keys to change the value

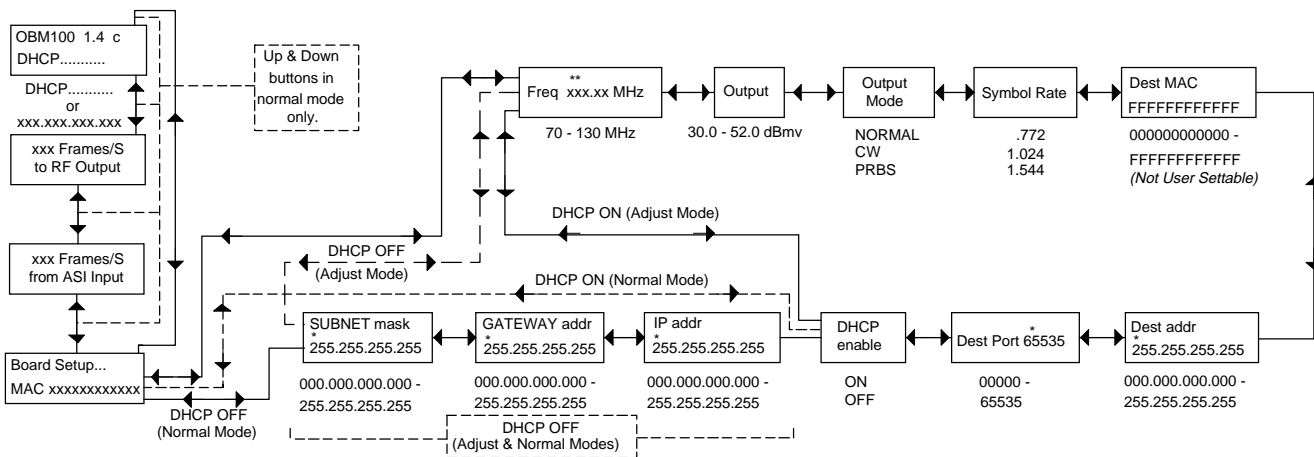
of the digit, and the LEFT or RIGHT keys to move to another digit. Note that the astrisk(s) will not appear when scrolling through adjustable parameters using the LEFT arrow key unless it has already been activated using the RIGHT arrow key.

When ENTER is pressed, the new settings will be loaded and stored and the unit will exit the 'adjust' mode. You may wish to not press ENTER until you have gone through all screens and settings and then press ENTER to save and load all changes in one step, OR you can store just one or several parameters at a time and reenter adjust mode to set the next. Either method is acceptable.

The OBM100 has displays that show the number of frames per second that are input from the ASI inputs and are being sent to the RF output. Each frame that comes from the ASI inputs contains seven packets of 188 bytes each (1316 bytes). If a connection to the headend (as defined by the destination address) has not been established through an ARP reply, then the characters that display the number of frames per second for the ASI input is replaced with a "NC" display.

The frames being sent to the RF output contain between one and seven packets of 188 bytes, depending upon what is being sent to the OBM100 from the headend controller. The headend controller will need to send frames with seven packets in each frame to allow the unit to function properly when high data rates are being sent through the RF output.

OBM100 QPSK DATA MODULATOR SOFTWARE FLOW CHART



SETTINGS

Frequency: Set the output frequency of the OBM100 as required by the system map design. The frequency range is from 70 to 130 MHz, adjustable in .05 MHz steps.

Output: Set the desired RF output signal level. The available range is from 30.0 to 52 dBmV in .5 dBmV steps. The output accuracy is ± 1 dB.

OUTPUT MODE: For normal operation, select NORMAL. For system level set up, choose CW to provide a CW carrier at the center frequency of the output channel for use in leveling a system when a QAM power meter is not available. In the CW mode, the CW carrier can be measured on a

spectrum analyzer without a need to apply a bandwidth correction or it can be measured with an analog meter tuned to channel center. The CW power measured will equal the channel QAM power when the modulator is returned to normal output mode. Usually QAM signals are set 5 dB below analog NTSC channels when balancing a system.

The PRBS menu entry is used for testing purposes only and should normally not be selected by the user.

Symbol Rate: This setting allows selection of the output symbol rate. Set as required by the set top boxes. The choices are .772, 1.024, and 1.544 MHz.

Dest MAC: The MAC (Media Access Control) number for the PC based Headend Controller is displayed. This number will automatically be set once the Headend Controller has returned an ARP reply to the OBM 100.

Dest addr: Set the IP address of the Headend Controller here. If the Controller uses a Windows based system, typing in "ipconfig" from the Controller command window should reveal this address.

Dest Port: This menu entry is used to enter the desired port address of the Headend Controller. The address range is from 00000 to 65535.

DHCP enable: This menu entry allows DHCP (Dynamic Host Configuration Protocol) to be enabled (ON) or disabled (OFF). When enabled, and if the Headend Controller is DHCP capable, the OBM100 IP address, Gateway address

and Subnet mask address will be set automatically. In this event, the next menu step will be back to the "Freq" screen in adjust mode, or the "MAC" screen in normal mode.

IP addr: This menu entry allows the user to set the OBM100 IP address if DHCP enable is turned off. This screen will not appear if DHCP enable is turned on.

GATEWAY addr: This screen will only appear if DHCP enable is turned off. It allows the user to set the OBM100 gateway address. If DHCP is enabled, this address is set automatically by the Headend Controller.

SUBNET mask: This screen will be visible only if DHCP enable is turned off. It allows the user to set the subnet mask for the OBM100. If DHCP enable is turned on, this parameter is set automatically by the Headend Controller.

ADDITIONAL INFORMATION

The OBM100 display showing the version number can also display additional unit status and error conditions. A "c" will appear to the right of the version number if the Headend Controller has returned an ARP reply to the OBM100 indicating a connection being made to the OBM100. If this "c" does not appear, the OBM100 will not send UDP packets out the Ethernet connector. In the upper right hand corner of the display and "E" will be displayed when an overrun error is detected, a "P" will be displayed when an Ethernet UDP message pacing violation is detected, an "R" will be displayed when an Ethernet receive error is detected or a "T" will be displayed when an Ethernet transmit error is detected.

NOTE: Ethernet UDP frames sent from the Headend Controller to the OBM100 must be paced at a consistent rate when sending near the maximum rate for the selected Symbol Rate to avoid dropped packets.

To update the OBM100 Application & FPGA by loading through the Ethernet:

- 1) Create a folder with a name of the OBM100 current version number and copy to this folder the latest "OBM100.srec" and "OBM100.rpd" files.
- 2) Plug in the Ethernet to have the DHCP get an IP Address or manually enter an IP Address.
- 3) Press and hold the left, up and store buttons on the front panel until "Load Memory" message appears.
- 4) With a web browser (Internet Explorer), select the IP address from step 2 and enter.
- 5) For Application press "Browse" and select file "OBM100.srec".
- 6) For FPGA press "Browse" and select file "OBM100.rpd".
- 7) Press "Send". OBM100 should display "Loading". After about 1 minute the display should show "Successful Load" for about 5 seconds followed by the "OBM100" display.

SERVICE INFORMATION

You may contact the R.L. DRAKE Service Department for additional information or assistance by calling +1 (937) 746-6990, Monday through Friday, between 8:00 A.M. and 4:00 P.M. Eastern Time, except on holidays.

You may also contact the R.L. DRAKE Service Department by E-mail at the following address:
TechSupport@rldrake.com
or by Telefax:
+1 (937) 806-1576.

Should you want to return your unit for service, package the unit carefully using the original carton or other suitable container.

Write your return address clearly on the shipping carton and on an enclosed cover letter describing the service required, symptoms or problems. Also include your daytime telephone number and a copy of your proof of purchase.

The unit will be serviced under the terms of the R.L. DRAKE LLC Limited Warranty and returned to you.

IF YOU NEED TO CALL FOR HELP

Call our Customer Service/Technical Support line at +1 (937) 746-6990 between 8:00 A.M. and 4:00 P.M. Eastern Time, weekdays. Please have the unit's serial number available. We will also need to know the specifics of any other equipment connected to the unit.

When calling, please have the unit up and running, near the phone if possible. Our technician(s) will likely ask certain questions to aid in diagnosis of the problem. Also, have a voltmeter handy, if possible.

R.L. DRAKE also provides technical assistance by e-mail: TechSupport@rldrake.com
or by Telefax: +1 (937) 806-1576.

Many of the products that are sent to us for repair are in perfect working order when we receive them. For these units, there is a standard checkout fee that you will be charged. Please perform whatever steps are applicable from the installation sections of the Owner's Manual before calling or writing—this could save unnecessary phone charges. Please do not return the unit without contacting R.L. DRAKE first: it is preferred to help troubleshoot the problem over the phone (or by mail) first, saving you both time and money.

Inside the carton, enclose a note with your name, address, daytime phone number, and a description of the unit's problem.

The unit must be sent to the following address:

Service Department
R.L. DRAKE LLC
230 Industrial Drive
Franklin, Ohio 45005 U.S.A.

Be sure to include your street address which will be needed for UPS return. UPS Surface (Brown Label) takes 7-10 days to reach us depending on your location, Blue takes 2-3 days.

Red is an overnight service. Send the unit in a way that it can be traced if we can't verify receipt of shipment. We suggest UPS or insured postal shipment.

If the unit is still under the original owner's warranty, R.L. DRAKE will pay the cost of the return shipment to you. Our return shipping policy is that we will return it UPS Brown if received Brown or by US Mail, it will be returned Blue if received Blue or Red—or it will be returned however you prefer if you furnish the return cost for the method you select.

If the unit is out of warranty, use one of the following methods for return shipment:

- 1) You designate billing to American Express, VISA, MasterCard or Discover card;
- 2) You prepay the service charges with a personal check, or
- 3) You specify some other method of return and payment.

When calling, the technician can estimate the repair charges for you over the phone. This is another good reason to call before sending a unit in for repair. Typically, equipment is repaired in five to ten working days after it arrives at R.L. DRAKE if we have all the facts. If we must call you, it may take longer. R.L. DRAKE is not responsible for damage caused by lightning, nonprofessional alterations, "acts of God", shipping damage, poor storage/handling, etc. R.L. DRAKE will make note of any shipping damage upon receipt.

You will need to send proof of purchase to receive warranty service. Typically, a copy of the invoice from an R.L. DRAKE dealer will suffice. The warranty is for the original owner only and is not transferable.

Three Year Limited Warranty

R.L. DRAKE LLC warrants to the original purchaser this product shall be free from defects in material or workmanship for three (3) years from the date of original purchase.

During the warranty period the R.L. DRAKE LLC or an authorized Drake service facility will provide, free of charge, both parts and labor necessary to correct defects in material and workmanship. At its option, R.L. DRAKE LLC may replace a defective unit.

To obtain such a warranty service, the original purchaser must:

- (1) Retain invoice or original proof of purchase to establish the start of the warranty period.
- (2) Notify the R.L. DRAKE LLC or the nearest authorized service facility, as soon as possible after discovery of a possible defect, of:
 - (a) the model and serial number,
 - (b) the identity of the seller and the approximate date of purchase; and
 - (c) A detailed description of the problem, including details on the electrical connection to associated equipment and the list of such equipment.
- (3) Deliver the product to the R.L. DRAKE LLC or the nearest authorized service facility, or ship the same in its original container or equivalent, fully insured and shipping charges prepaid.

Correct maintenance, repair, and use are important to obtain proper performance from this product. Therefore carefully read the Instruction Manual. This warranty does not apply to any defect that R.L. DRAKE LLC determines is due to:

- (1) Improper maintenance or repair, including the installation of parts or accessories that do not conform to the quality and specifications of the original parts.
- (2) Misuse, abuse, neglect or improper installation.
- (3) Accidental or intentional damage.

All implied warranties, if any, including warranties of merchantability and fitness for a particular purpose, terminate three (3) years from the date of the original purchase.

The foregoing constitutes R.L. DRAKE LLC'S entire obligation with respect to this product, and the original purchaser shall have no other remedy and no claim for incidental or consequential damages, losses or expenses. Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusions or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This warranty shall be construed under the laws of Ohio.

For Service, contact:

R.L. DRAKE LLC
230 Industrial Drive
Franklin, Ohio 45005 U.S.A.
Customer Service and Parts Telephone: +1 (937) 746-6990
Telefax: +1 (937) 806-1576
World Wide Web Site: <http://www.rldrake.com>



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