

Figure 1

The R.L. Drake model TMQAM and TMQAMasi modulators are professional quality modular digital headend components designed to provide optimum performance with minimized rack space requirements. These modulators accept an MPEG2 transport stream input in either the SPI format or ASI serial format, depending on the model, and is capable of providing a QAM output with 16, 32, 64, 128, or 256 constellation points.

The modulators perform the forward error correction (FEC) encoding according to ITU J.83 Annex A or Annex B. Annex A is referred to as 'DVB' and Annex B is referred to as 'DigiCipher II®'. The front panel push-buttons and display provide full access to many other parameters that can be set to match a particular application.

The TMQAM model provides a choice of two clock modes. In the 'Auto' mode, the output clock rate is automatically locked to the incoming data clock rate.

Thus the output symbol rate can change if the input data rate changes. The TMQAMasi model does not have an "Auto" selection. In the 'Fixed' mode, the desired output symbol rate is programmed from the front panel. This rate must be equal to or greater than the incoming data rate. The output rate will be maintained at the set rate and if the input rate is slower than this rate, the TMQAM and TMQAMasi will add null packets to make up for the slower input rate.

The modulators have several test modes that can be selected. In these modes, a pseudo-random binary sequence stream is substituted for the input source. This will provide a modulated output without any external input source.

A CW output mode is selectable to allow measurement of the output level with an analog signal meter.

The RF output is +30 dBmV. This IF output can be connected to one of the DRAKE DUC series of digital upconverters to provide an output on a CATV or broadcast channel.

F1 - LCD Display
Displays the modulator parameter and its setting.

F2 - ENTER
Use the ENTER button to enter the adjust mode or to save and load a new parameter value. Hold for 2 seconds to enter the adjust mode. After adjustment, press this button once to load and save the value.

F3 - Left and Right Button
Use the Left and Right buttons to select the parameter you desire to view or adjust.

F4 - Up and Down Buttons
Use the Up and Down buttons to adjust a parameter value when in the adjust mode. When not in the adjust mode, the UP button displays the version number. The Down button displays the incoming bit rate if the "AUTO" clock mode has been selected.

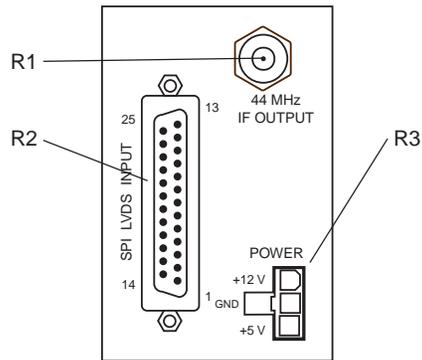


Figure 2

R1 - 44 MHz IF OUTPUT Connector

This is the modulator output. The level is +30 dBmV.

R2 - 25 Pin SPI LVDS INPUT Connector

This is the MPEG2 transport stream input - DVB Synchronous Parallel Interface. The levels comply with low voltage differential signalling specifications.

R3 - DC Power Connector

This is the power input connector. Connect to a Drake PS8 or equivalent power supply, (12 V @ 0 mA, 5 V @ 380 mA for the SPI input version).

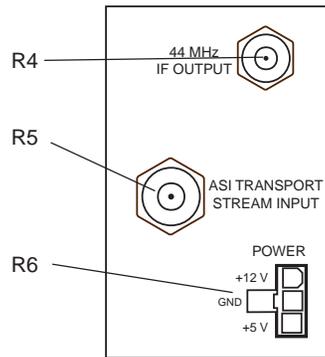


Figure 3

R4 - 44 MHz IF OUTPUT Connector

This is the modulator output. The level is +30 dBmV.

R5 - 75 Ohm, Type BNC Connector

This is the MPEG2 transport stream input; ASI input, asynchronous serial interface.

R6 - DC Power Connector

This is the power input connector. Connect to a Drake PS8 or equivalent power supply, (12 V @ 0 mA, 5 V @ 500 mA for the ASI input version).

CONNECTIONS AND CONTROLS

All connections to and from each modulator are made through the rear panel. Refer to Figure 4 for correct cable and wiring connections.

RACK MOUNTING

Adequate ventilation is very important in multichannel installations. Units should be spaced apart by at least one panel height wherever possible, and some air movement is mandatory in enclosed rack cabinets. Excessive heat will shorten component life and modulator performance will be degraded without proper cooling.

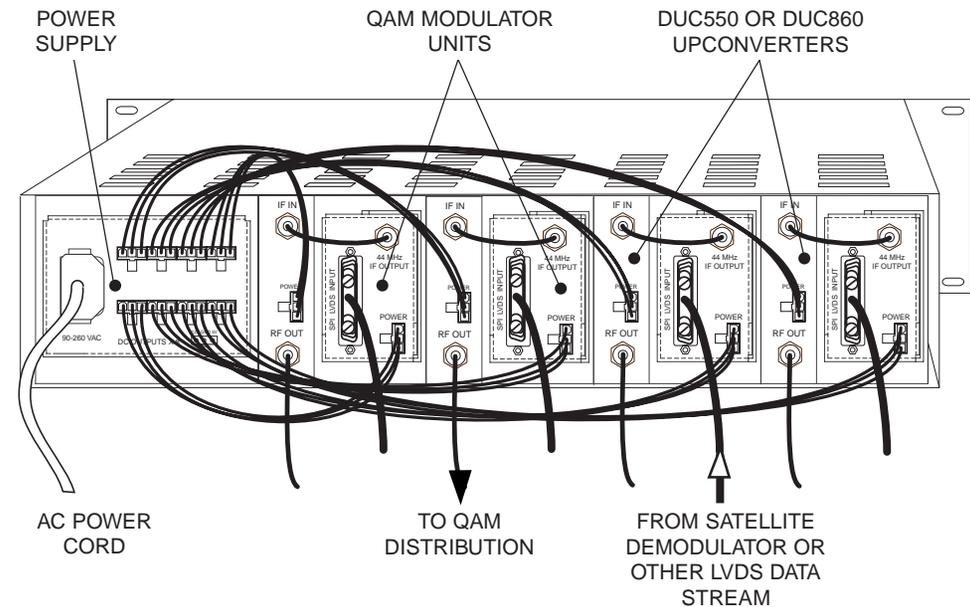


Figure 4

TMQAM OPERATION AND SETUP

The TMQAM provides user access to many parameters of the modulator so that it can be setup to precisely match the requirements of the system.

1) To VIEW parameter settings only – no adjustment:

Press either the left or right arrow buttons to scroll through each parameter page. The parameter is listed on the first line of the display and the present setting will be displayed on the second line. After viewing, press the left or right arrow button again to advance to the next parameter. After viewing, the display will time-out and return to the output baud (BD) rate/symbol rate page.

2) To ADJUST or change parameter settings or for initial set up, follow these steps:

Press and hold the enter button for 2 to 3 seconds until the display begins to flash. Press the left or right arrow button to scroll to the desired parameter. Now press the up or down arrow button to adjust the parameter value. Note that no change is made at this point until the new value is loaded and saved. When the value is adjusted to the value required, press the enter button again. This will load and save the new value until this procedure is repeated.

Output

Output Frequency: 44 MHz.
 Output Level: +30 dBmV.
 Output Impedance: 75 Ohms.
 Spurious Outputs: -55 dBc typical, in band or in adjacent channels.
 -60 dBc otherwise when used with Drake DUC550 or DUC860 upconverter modules.
 MER: 38 dB minimum.

Modulation

Mode: 16, 32, 64, 128, 256 QAM.
 Symbol Rate: 7.0 Msymbols/s Max.
 Excess Bandwidth: 15% (ITU-A), 18% (ITU-B).

FEC Encoding

FEC Modes: DVB/DAVIC
 (ITU-T J.83 Annex A),
 Digicipher® II
 (ITU-T J.83 Annex B).

Input

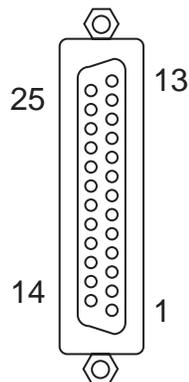
Transport Stream: TMQAM - Parallel Input according to DVB SPI, LVDS specifications.
 TMQAMasi - Serial input according to DVB ASI specifications.
 Connector: TMQAM - DB25 Female.
 TMQAMasi - BNC, 75 Ohms.

General

DC Power Required: TMQAM - 5 VDC @ 380 mA.
 TMQAMasi - 5 VDC @ 500 mA.
 Size: 2.06" W x 3.5" H x 9.25" D (5.23 cm W x 8.9 cm H x 23.5 cm D).
 Weight: 1 lb. 2 oz. (0.51 Kg).

The TMQAM and TMQAMasi modulator can operate in either of two clock modes:
 1) It can automatically lock to the incoming bit rates producing an output rate determined by the input stream. Power should be supplied by the model PS8 power supply module which also mounts into the DRMM12. The PS8 and DRMM12 are sold separately.
 2) It can be set, from front panel controls, to output a desired symbol rate using an internally generated clock. In this mode, when the input bit rate is less than that needed to produce the set output symbol rate, null packets are added by the modulator.
 The QAM signal must be up-converted to the desired channel with the Drake Up-Converter module, prior to transmission on the cable plant.

Specifications subject to change without notice or obligation.



Pin Out DVB SPI Interface

- | | |
|----------------------|----------------------|
| 1 Data Clk + | 14 Data Clk - |
| 2 GND | 15 GND |
| 3 Data 7 + | 16 Data 7 - |
| 4 Data 6 + | 17 Data 6 - |
| 5 Data 5 + | 18 Data 5 - |
| 6 Data 4 + | 19 Data 4 - |
| 7 Data 3 + | 20 Data 3 - |
| 8 Data 2 + | 21 Data 2 - |
| 9 Data 1 + | 22 Data 1 - |
| 10 Data 0 + | 23 Data 0 - |
| 11 Data Valid + | 24 Data Valid - |
| 12 Start of Packet + | 25 Start of Packet - |
| 13 GND | |

THREE YEAR LIMITED WARRANTY

R.L. DRAKE COMPANY 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 COMPANY 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 COMPANY may replace a defective unit.

To obtain such 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 COMPANY 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 COMPANY 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 necessary 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 COMPANY 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 COMPANY'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.



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