

CW-4191 ... CW-4196      CW-4197  
**QAM / QAM TRANSMODULATOR**



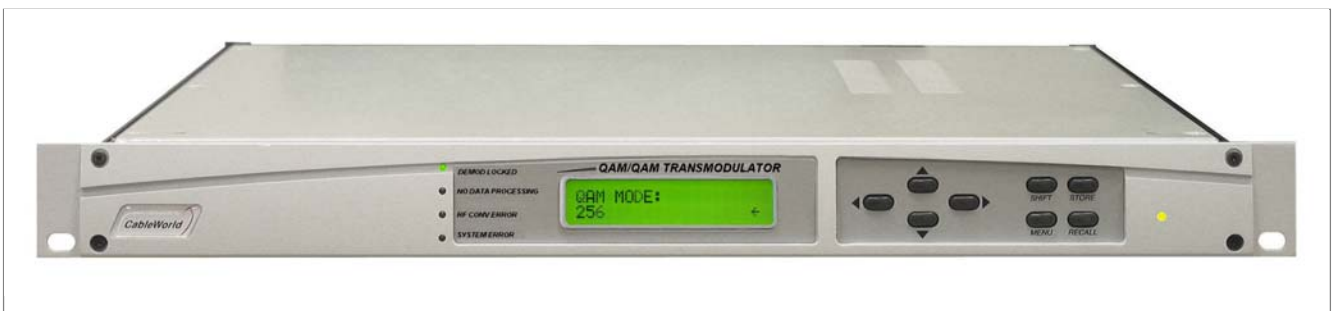
*In digital television systems, owing to the different properties of the transmitting mediums, different modulation techniques have been introduced for satellite-, terrestrial- and cable transmission.*

*In all three cases, the adapted modulation technique is effective and fits the nature of the transmission medium, including provision for correcting the errors arisen during transmission. The QAM modulation, which has been designed for cable transmission, can be utilized beyond the transmission through conventional coaxial cables also in optical transmission/distribution networks.*

*The CW-419x QAM/QAM TRANSMODULATOR has been designed for digital cable TV systems, where the headends are fed from the program provider centre through coaxial or optical transmission/distribution.*

*The CW-419x demodulates the incoming QAM signal and corrects the errors arisen in the data stream. Then it provides the already errorless signal with new error correction codes and using QAM modulation it transposes the signal on a new carrier frequency. The output signal of the unit can be directly combined with the other channels of the headend.*

*The CW-419x QAM/QAM TRANSMODULATOR can be advantageously used for distributing and feeding scrambled pay-TV programs, as well as for transmitting data streams according to the DVB standard.*



**Main features:**

- DVB-C compatibility
- Full band front end
- Programmable input and output frequency
- QPSK, 16-, 32-, 64-, 128- and 256-QAM mode
- Wide variety of input and output modes
- Conversion through TS with full error correction
- Widely variable data rate
- Programming from the front panel, supported by a two row alphanumeric LCD display
- Control from central computer through data bus
- High output level, high signal purity
- 19" rack frame with 1 module height

**TECHNICAL DATA**

<b>TV STANDARD</b>	DVB-C / MPEG2 EN 300 744
<b>INPUT DATA</b>	
Input signal	QAM modulated RF carrier
Input frequency band	51 - 858 MHz
Input signal level	44 ... 84 dB $\mu$ V
IF bandwidth	8 MHz
Modulation modes	4, 16, 32, 64, 128, 256-QAM
Symbol rate	1 ... 7 Ms/s
Input impedance	75 $\Omega$
<b>OUTPUT DATA</b>	
<i>IF signal processing:</i>	
Modulation system	DVB
Modulation	QAM according to ETS 300 429
QAM constellations	4, 16, 32, 64, 128, 256
Symbol rate	1 - 7 Msps (automatically synchronized to the TS signal)
IF frequency	36.15 MHz (variable between 29 ... 42 MHz in 50 kHz steps)
IF bandwidth	8 MHz
Roll-off	12, 15, 18 %
IF spectrum	normal, inverse, CW
MPEG synchronization	automatic, or by sync bytes
<i>Output parameters:</i>	
Operational frequency band	
CW-4191	48 ... 63 MHz
CW-4192	76 ... 94 MHz
CW-4193	150 ... 300 MHz
CW-4194	300 ... 470 MHz
CW-4195	470 ... 862 MHz
CW-4196	110 ... 150 MHz
CW-4197*	48 ... 862 MHz
Frequency raster	50 kHz

\* Output data of the CW-4197 see at the CW-4157 QAM Modulator.

Number of RF outputs	1
RF output connector	F type socket
Nominal output impedance	75 $\Omega$
Nominal output level	120 dB $\mu$ V
adjustable range	0 ... -12 dB programmable
Frequency accuracy	better, than $1 \times 10^{-4}$ (synthesizer)
Output stability	better, than $\pm 0.5$ dB
Signal purity	
- harmonic level	less, than -60 dB
- other products	less, than -60 dB

**CW BUS**

Loop through input and output to cascade the unit onto the control bus. Through the bus the unit's parameters and modes can be set and its operation can be supervised.

**SUPPLEMENTARY DATA**

Effective bandwidth [MHz]  $B = 1.15 S / \log_2 n$   
where S: symbol rate [MHz]  
n: format of QAM (4 ... 256)

**GENERAL DATA**

Service period	continuous
Power requirement	230 V +10 ... -15 % 50 / 60 Hz
Power consumption	max. 50 VA
Physical dimensions	
width	483.0 mm
height	43.6 mm
depth	473.0 mm
Mass	approx. 4.2 kg
Operational temperature range	
- to fulfil the specifications	+10 ... +35 $^{\circ}$ C
- to maintain operation	0 ... +40 $^{\circ}$ C
Storage temperature	- 25 ... +45 $^{\circ}$ C

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