

- 4400.0 to 4940.0; 5091.0 to 5150.0 MHz
- 9 Cubic Inches
- DC-Coupled
- Multi-Mode
- 10 or 20 Watts (Minimum)
- TTL or RS422 Compatible
- PCM/FM, SOQPSK, Multi-h CPM

DESCRIPTION - SEMCO's TT09 Series Transmitter is a multi-mode digital transmitter that is ideal for airborne and other transmitter applications requiring support of legacy PCM/FM modulation modes as well as the more spectrum efficient ARTM Tier I SOQPSK-TG and Tier II Multi-h CPM. The transmitter's design combines small size (9 cubic inches) with excellent size to output power ratios. Programmable in 1 MHz steps, the transmitter provides for frequency agility in C-band. It is DC-Coupled for optimum performance; with an efficient maximum power draw of 1.8 A (10W) and 2.4 A (20W) at 28 VDC.

The TT09 Transmitter's spectral mask is IRIG 106-13 Tier II phase noise compliant, and offers programmable data rates from 500 kbps to 23 Mbps (PCM/FM) and 500 kbps to 40 Mbps (SOQPSK-TG and Multi-h CPM).

Systems Engineering & Management Co.
 1430 Vantage Court
 Vista, CA 92081-8596



TT09 SERIES SPECIFICATIONS

RF OUTPUT	
CARRIER FREQUENCY:	4400.0 to 4940.0: 5091.0 to 5150.0 MHz
STEP SIZE:	Channelized in 1.0 MHz Steps
CARRIER STABILITY:	Within $\pm 0.002\%$ over -20°C to $+70^{\circ}\text{C}$
POWER:	10/20 Watts Minimum (Specify)

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TT09 SERIES SPECIFICATIONS

VSWR:	1.5:1 Maximum
IMPEDANCE:	50 Ohms Nominal
LOADING:	Normal Operation into any Load VSWR and Phase Angle
OPEN/SHORT PROTECTION:	Internal Isolator
HARMONIC & SPURIOUS LEVEL:	In accordance with Latest IRIG Specifications
INCIDENTAL AM:	1% Maximum
WARM-UP TIME:	Less than 250 Milliseconds
DIGITAL INPUT	
DATA LEVELS:	RS422 Compatible
CLOCK LEVELS:	RS422 Compatible
MODULATION TYPES:	PCM/FM, SOQPSK, Multi-h CPM
BIT RATE:	PCM: 500 Kbits/Sec TO 20 Mbits/Sec
	SOQPSK/Multi-h CPM: 1.0 Mbits/Sec to 40 Mbits/Sec
SPECTRAL MASKS:	PCM/FM: Per IRIG 106-01 Spectral mask for PCM/FM (Tier 0)
	Deviation: $\pm 0.35 \times \text{Bit Rate}$
	Conditioning: 6 Pole Bessel Digital Filter at $0.7 \times \text{Bit Rate}$
	SOQPSK: Per IRIG 106-01 Quaternary Spectral Mask (Tier 1)
	Multi-h/CPM: Per ARTM Spectral Mask (Tier 2)
RANDOMIZER:	15 Stage IAW IRIG 106-07

POWER REQUIREMENTS	
INPUT VOLTAGE:	+28 \pm 4 VDC: Reverse Polarity Protected
INPUT OVERVOLTAGE:	+40 VDC for 30 Seconds with No Damage
INPUT CURRENT @ +28 VDC:	10 Watts: 1.8 Amps Maximum
	20 Watts: 2.4 Amps Maximum

ENVIRONMENTAL SPECIFICATIONS	
TEMPERATURE:	Operating: -20° to +70°C; Storage: -54°C to +125°C
VIBRATION:	14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes
SHOCK:	1/2 Sine, 100 G's Pk, 11 mS, 3 Axes
ACCELERATION:	100 G's, 3 Axes

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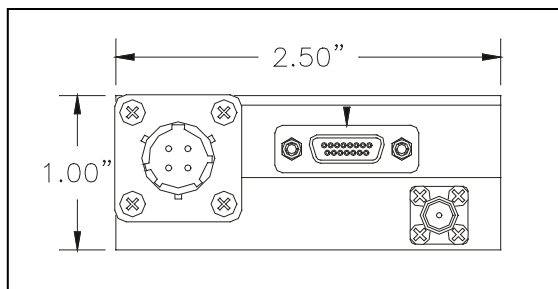
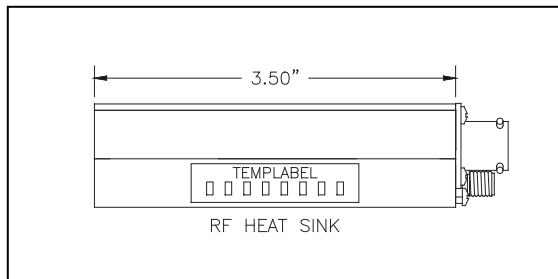
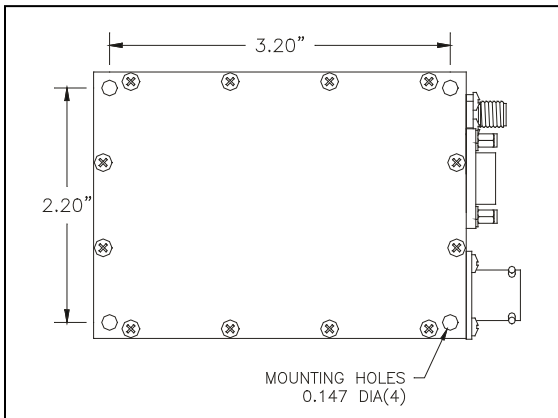


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ALTITUDE:	Unlimited
HUMIDITY:	To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

DIMENSIONS:	Per Outline Drawing
Weight:	12 oz Maximum



J1-CONTROL/DIGITAL IN MDM-15P

PIN

1	N/C
2	GROUND
3	RECALL
4	-RS422 CLOCK/ N/C
5	-RS422 DATA/ N/C
6	N/C
7	RS232 TX
8	RS232 RX
9	N/C
10	GROUND
11	RF HIGH/LOW
12	+RS422 CLOCK/TTL CLOCK
13	+RS422 DATA/TTL DATA
14	SERIAL CONTROL GND
15	XMTR ENABLE

Protected by one or more of the following patents:

US: 5,091,706, 5,097,230, 5,311,152, 5,497,509, 5,802,462, 6,404,292, 6,411,237, 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517 and 6,771,133.

Canadian: 2,033,861, 2,033,878, 2,080,013, 2,097,042, 2,235,091 and 2,308,209.

Other US and Canadian patents pending

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TT09 SERIES SPECIFICATIONS

TT09-GX D 103-0 1 0 4 3 0

TELEMETRY TRANSMITTER; 9 IN³

(ADDITIONAL OPTIONS 1-6)

FREQUENCY BAND	
GX	4400.0 to 4940.0 / 5091.0 to 5150.0 MHz

OUTPUT POWER	
103:	10W
203	20W

DC COUPLED

ADDITIONAL OPTIONS 1		ADDITIONAL OPTIONS 2		ADDITIONAL OPTIONS 3	
CODE	OPTION	CODE	OPTION	CODE	OPTION
0	NO OPTIONS	1	M83513/04-B07N CONNECTOR	0	NO OPTIONS
1	LOW TEMP	2	M83513/03-B07N CONNECTOR	2	FORWARD ERROR CORRECTION*
2	HIGH TEMP	4	CLOCK FREE INTERFACE	4	TEMPERATURE READOUT
3	HIGH TEMP + LOW TEMP	5	CLOCK FREE + M83513/04-B07N	6	TEMPERATURE READOUT + FORWARD ERROR CORRECTION*
4	MULTIPLE POWER	6	CLOCK FREE + M83513/03-B07N	8	RANDOMIZER
5	MULTIPLE POWER + LOW TEMP	8	INTERNAL CLOCK DATA	A	RANDOMIZER + FORWARD ERROR CORRECTION*
6	MULTIPLE POWER + HIGH TEMP	9	INTERNAL CLOCK DATA + M83513/04-B07N	C	RANDOMIZER + TEMP READOUT
7	MULTIPLE POWER + LOW TEMP + HIGH TEMP	A	INTERNAL CLOCK DATA + M83513/03-B07N	E	RANDOMIZER + TEMP READOUT + FORWARD ERROR CORRECTION*
		C	INTERNAL CLOCK DATA + CLOCK FREE INTERFACE		
		D	INTERNAL CLOCK DATA + CLOCK FREE INTERFACE + M83513/04-B07N		
		E	INTERNAL CLOCK DATA + CLOCK FREE INTERFACE+ M83513/03-B07N		
ADDITIONAL OPTIONS 4		ADDITIONAL OPTIONS 5		ADDITIONAL OPTIONS 6	
CODE	OPTION	CODE	OPTION	CODE	OPTION
1	TTL CLOCK AND DATA	0	NO OPTIONS	0	NO OPTIONS
2	RS422 CLOCK AND DATA	1	PCM-FM	2	RF H/L (EXTERNAL CONTROL)
4	SERIAL CONTROL (RS232)	2	SOQPSK	4	RECALL (EXTERNAL)
5	SERIAL CONTROL (RS232) + TTL CLOCK AND DATA	3	PCM-FM + SOQPSK	6	RECALL + RF H/L (EXTERNAL)
6	SERIAL CONTROL (RS232) + RS422 CLOCK AND DATA	4	MULTI-H CPM	8	TRANSMITTER ENABLE (EXTERNAL)
7	RS422 CLOCK AND DATA + TTL CLOCK AND DATA	5	MULTI-H CPM + PCMFM	A	TRANSMITTER ENABLE + RF H/L (EXTERNAL)
8	PARALLEL CONTROL (TTL)*	6	MULTI-H CPM + SOQPSK	C	TRANSMITTER ENABLE + RECALL (EXTERNAL)
9	PARALLEL CONTROL (TTL) + TTL CLOCK AND DATA*	7	MULTI-H CPM + SOQPSK + PCM-FM		
A	PARALLEL CONTROL (TTL) + RS422 CLOCK AND DATA*				
C	PARALLEL CONTROL (TTL) + SERIAL CONTROL*				
D	PARALLEL CONTROL (TTL) + SERIAL CONTROL + TTL CLOCK AND DATA*				
E	PARALLEL CONTROL (TTL) + SERIAL CONTROL + RS422 CLOCK AND DATA*				

* OPTION IN DEVELOPMENT

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