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TECHNOLOGY GROUP

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so your equipment works exactly as you specify.

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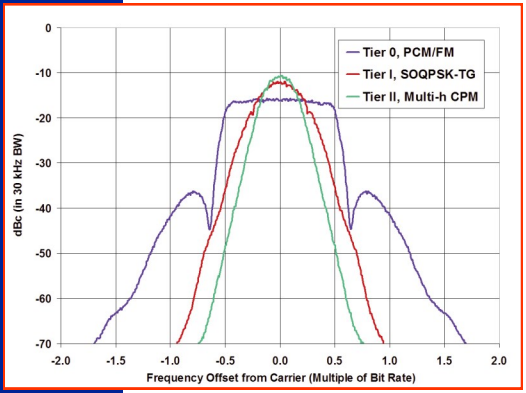
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Reinventing Telemetry™

Quasonix

MULTI-MODE TELEMETRY TRANSMITTERS





TIMTER™



TIMTER™



nanoTX™

- ***Industry Leader in Transmitter Technology***
  Providing proven quality and performance in over 10,000 transmitters shipped, TIMTER™ transmitters combine compact designs with outstanding size to power ratios, plus seamless integration and flexibility.
- ***4th Generation C-band TIMTER™***
  C-band is now offered in our 2.0 in^3 and 1.3 in^3 packages. At less than 0.35 inches tall, the C-band TIMTER™ can serve as a drop-in replacement for common 0.8 inch-tall transmitters
- ***Exceptional DC-to-RF Conversion Efficiency***
  Facilitates replacement of older 10 W transmitter with new 20 W transmitter at same current draw
- ***L/C Band TIMTER™***
  Single transmitter configuration covering a frequency tuning range spanning L and C bands
- ***S/C Band TIMTER™***
  With output power up to 20 W, this configuration has a carrier frequency tuning range spanning S and C bands
- ***L/S Band TIMTER™***
  Highly flexible solution available with all three legacy TM bands: lower L, upper L, and full S
- ***L/S/C Band TIMTER™***
  Ultimate solution with lower L, upper L, full S, and full C bands
- ***Output Power from 10 mW to 25 W***
  Several RF output choices, along with variable power and dual power options for software or hardware based power adjustment
- ***Smallest ARTM Transmitter***
  1.3 in^3 nanoTX™ transmitter ideal for airborne applications with strict SWAP constraints; Available in S band
- ***Automatic Data Rate Tracking***
  Premod filtering and deviation automatically track the data rate, with no programming or configuration required
- ***Clock-Free Input Option Available***
  Ideal for replacing analog transmitters or for use with encoders or cryptos that provide a data output only

ISO 9001:2015 Certified

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QSX-CATALOG-180201

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TIMTER™ TRANSMITTER SPECIFICATIONS

Characteristic	Specification
Main Section	
Modulation type	PCM/FM (ARTM Tier 0), SOQPSK-TG (ARTM Tier I), Multi-h CPM (ARTM Tier II), BPSK, QPSK, OQPSK, UQPSK, STC

Carrier frequency tuning range

(All frequency bands may be tuned 0.5 MHz above or below the stated frequency.)

Note: Currently the MA option enables below Lower S band frequencies (2025.0 MHz to 2110.0 MHz) for use in Space operations and Space research.

For additional information about this option or about specific frequency bands, contact Quasonix.

*Custom frequency ranges are available. Contact Quasonix for details.

Band ID Code	Lower L band 1435.5-1534.5 MHz	Upper L band 1750.0-1855.0 MHz	Lower S band 2200.5-2300.5 MHz	Upper S band 2300.5-2394.5 MHz	C band 4400.0-4950.0 MHz	Mid C band 5091.0-5150.0 MHz	Euro Mid C band 5150.0 - 5250.0 MHz	Max Power
A			x					25 W
B						x	x	20 W
C					x			20 W
D					x	x		20 W
E	x	x	x	x	x	x	x	10 W
F			x	x	x			20 W
G							x	20 W
H	x				x			10 W
J					x	x	x	18 W
K			x	x	x	x	x	18 W
L	x							20 W
M	x	x	x	x				20 W
N				x				25 W
Q	x	x	x	x	x	x		10 W
S			x	x				25 W
T	x				x	x		20 W
V			x	x	x	x		20 W
W			x	x		x	x	18 W
X						x		20 W
Y	x	x			x	x		20 W
Z	x						x	20 W

RF output power

TIMTER L, S, C, L/S, L/C and S/C bands: 10 mW, 20 mW, 1 W, 5 W, 10 W, 20 W
TIMTER S band: 10 mW, 20 mW, 1 W, 5 W, 10 W, 20 W, 25 W
TIMTER L/S/C band: 10 mW, 20 mW

Option DP: Dual power, 64 settings, user selects one for "high" and one for "low", chosen via baseband connector pin

Option VP: Variable power, 64 settings approximately 0.5 dB apart;
Packages of 2 cubic inches or less: 32 settings approximately 1.0 dB apart

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TIMTER™ TRANSMITTER SPECIFICATIONS

Characteristic	Specification
Data (bit) rate, automatic rate adaptation	TIMTER: 0.1-28 Mbps (0.05-14 Mbps for PCM/FM) TIMTER *option* HR: Extends upper limit to max of 46 Mbps for SOQPSK and ARTM CPM (23 Mbps for PCM/FM) TIMTER *option* LR: Extends lower limit to min of 50 kbps for SOQPSK and ARTM CPM (25 kbps for PCM/FM)
Clock Free Data (bit) rate	With BR x command: Allows user to enter a fixed bit rate in the range defined in the Data (bit) rate specifications above With BR A command: Automatically detects bit rate in the range defined in the Data (bit) rate specifications above; Quasonix guarantees automatic bit rate operation up to 35 Mbps; beyond that operation is dependent on input data signal quality (jitter, truly random data, etc.)
Input current @ +28 VDC	
Input voltage	Standard: +28 ± 4 VDC With optional wide voltage (WV option): +6.5 to +34 VDC for 10 mW, 20 mW, 1 W, 2 W models +12 to +34 VDC for 5 W model +21 to +34 VDC for 10 W, 20 W, and 25 W models Note: The WV option is not supported on 25 W S band and 20 W L/C or S/C band transmitters.

TIMTER L or S band, 10 mWatt	0.30 A max.	0.25 A typical
TIMTER L or S band, 20 mWatt	0.35 A max.	0.30 A typical
TIMTER L or S band, 5 Watt	0.8 A max.	0.7 A typical
TIMTER L or S band, 10 Watt (2in^3 packages)	1.4 A max.	1.1 A typical
TIMTER L or S band, 10 Watt (>2in^3 packages)	1.8 A max.	1.5 A typical
TIMTER L or S band, 18 or 20 Watt	2.8 A max.	2.5 A typical
TIMTER L/S band, 5 Watt	1.2 A max.	1.0 A typical
TIMTER L/S band, 10 Watt	2.2 A max.	1.8 A typical
TIMTER L band, 18 or 20 Watt	3.2 A max.	2.8 A typical
TIMTER S band, 18 or 20 Watt	2.8 A max.	2.5 A typical
TIMTER S band, 25 Watt	3.2 A max.	2.9 A typical
TIMTER C band, 10 mWatt	0.30 A max.	0.25 A typical
TIMTER C band, 20 mWatt	0.35 A max.	0.30 A typical
TIMTER C band, 5 Watt	1.5 A max.	1.3 A typical
TIMTER C band, 10 Watt	2.4 A max.	1.9 A typical
TIMTER C band, 18 or 20 Watt	3.4 A max.	3.0 A typical
TIMTER L/C band and S/C band, 10 mWatt	0.30 A max.	0.25 A typical
TIMTER L/C band and S/C band, 20 mWatt	0.40 A max.	0.35 A typical
TIMTER L/C band and S/C band, 10 Watt	2.0 A max.	1.8 A typical
TIMTER L/C band and S/C band, 18 Watt	3.5 A max.	3.2 A typical
TIMTER L/S/C band, 10 mWatt	0.45 A max.	0.40 A typical
TIMTER L/S/C band, 20 mWatt	0.50 A max.	0.45 A typical
TIMTER L/S/C band, 5 Watt	2.2 A max.	1.5 A typical
TIMTER L/S/C band, 10 Watt	2.5 A max.	1.8 A typical

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TIMTER™ TRANSMITTER SPECIFICATIONS

Characteristic	Specification
Power reversal	Reverse voltage protection
Serial Control interface	1 - LVTTL serial control interface: 57,600 baud rate 2 - RS-232 serial control interface: 57,600 baud rate T - TTL serial control interface: 57,600 baud rate 4 - RS-422 serial control interface: 57,600 baud rate
Clock and Data signal interfaces (Serial data with separate synchronous clock) (Input impdedances are only specified when unit is powered On, unless explicit-ly stated as being valid in the Off state.)	H - TTL (10K ohms to ground) T - TTL (75 ohms to ground) A - TTL selectable between 75 ohms to GND and 10k ohms to GND R - TIA/EIA-422 (RS-422) - 120 ohms differential B - TIA/EIA-422 (RS-422) - 120 ohms differential, even when unit powered off M - Dual mode selectable (TTL terminated 10k ohms to GND, RS-422 term 120 ohms diff.) D - Dual mode selectable (TTL terminated 75 ohms to GND, RS-422 term 120 ohms diff.) S - Tri-mode selectable (TTL term 75 ohms to GND, TTL term 10k ohms to GND, and RS-422 term 120 ohms differential) L - LVDS (Low Voltage Differential Signal)
Carrier frequency tuning increment	0.5 MHz
Carrier frequency accuracy	± 1.0 ppm over temperature ± 6.0 ppm, all causes, including aging over 5 years
Randomizer	15-stage LFSR, per IRIG 106. Selectable for bypass or enable
Environmental Section	
Operating temperature	-40°C to +85°C (10 mW, 1 W, 5 W, 10 W models) -40°C to +70°C (20 W and 25 W models)
Non-operating temperature	-55°C to +100°C (all models)
Operating humidity	0 to 95% (non-condensing)
Altitude	Up to 100,000 ft.
Physical Section	
Dimensions	<table><tr><th>TIMTER™ Package</th><th>Volume</th><th>Width</th><th>Length</th><th>Height</th></tr><tr><td>02XX</td><td>1.992 in³</td><td>2.000”</td><td>3.000”</td><td>0.332”</td></tr><tr><td>04XX</td><td>4.200 in³</td><td>2.000”</td><td>3.000”</td><td>0.700”</td></tr><tr><td>05XX</td><td>4.800 in³</td><td>2.000”</td><td>3.000”</td><td>0.800”</td></tr><tr><td>06XX</td><td>6.072 in³</td><td>2.000”</td><td>3.000”</td><td>1.012”</td></tr><tr><td>07XX</td><td>6.546 in³</td><td>2.000”</td><td>3.000”</td><td>1.091”</td></tr><tr><td></td><td>6.672 in³</td><td>2.000”</td><td>3.000”</td><td>1.112”</td></tr><tr><td>08XX</td><td>7.590 in³</td><td>2.200”</td><td>3.450”</td><td>1.000”</td></tr><tr><td></td><td>8.418 in³</td><td>2.000”</td><td>3.450”</td><td>1.403”</td></tr><tr><td>09XX</td><td>9.180 in³</td><td>2.000”</td><td>3.000”</td><td>1.530”</td></tr></table>
Vibration	19.6 G (RMS) random, 20 Hz to 2,000 Hz, 3 axes
Shock	60 G (PK), 1/2 sine, 5 ms duration, 3 axes
Acceleration	100 G, 3 axes
Connector - RF	All TIMTER: SMA female
Connector – Baseband / Primary	TIMTER: MDM-15 (male or female)

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nanoTX™ TRANSMITTER SPECIFICATIONS

Characteristic	Specification
Main Section	
Modulation type	PCM/FM (ARTM Tier 0), SOQPSK-TG (ARTM Tier I), Multi-h CPM (ARTM Tier II), BPSK, QPSK, OQPSK, UQPSK
Carrier frequency tuning range (All nanoTX™ models)	2200.5 - 2300.5 MHz (Lower S band) 2289.5 - 2394.5 MHz (Upper S band)
RF output power	nanoTX and nanoPuck: 1 W, 2 W, 5 W, and 10 W *Option* DP: Dual power, 64 settings, user selects one for "high" and one for "low", chosen via baseband connector pin *Option* VP: Variable power, 32 settings over approx. 24 dB range via PC (non-uniform, largest step approximately 1 dB)
Carrier frequency tuning increment	0.5 MHz
Carrier frequency accuracy	± 1.0 ppm over temperature ± 6.0 ppm, all causes, including aging over 5 years
Data (bit) rate, automatic rate adaptation	nanoTX, nanoPuck: 0.1-28 Mbps (0.05-14 Mbps for PCM/FM) nanoTX *option* HR: Extends upper limit to max of 46 Mbps (23 Mbps for PCM/FM) nanoTX *option* LR: Extends lower limit to min of 50 kbps (25 kbps for PCM/FM)
Input voltage	nanoTX, nanoPuck: +28 ± 4 VDC Standard nanoTX, nanoPuck with *optional* wide voltage (WV option): +6.5 to +34 VDC for 1 Watt models +6.5 to +34 VDC for 2 Watt models +12 to +34 VDC for 5 Watt models +21 to +34 VDC for 10 Watt models
Input current @ +28 VDC	nanoTX, nanoPuck 1 Watt 450 mA max; 350 mA typical nanoTX, nanoPuck 2 Watt 570 mA max; 480 mA typical nanoTX, nanoPuck 5 Watt 1.0 A max; 800 mA typical nanoTX, nanoPuck 8 or 10 Watt 1.3 A max; 1.1 A typical
Power reversal	Reverse voltage protection
Control interface	1 - LVTTL serial control interface: 57,600 baud rate (nanoPuck) 2 - RS-232 serial control interface: 57,600 baud rate (nanoTX)
Signal interfaces	H - TTL 10k ohms to ground T - TTL 75 ohms to ground R - TIA/EIA-422 (RS-422) - 120 ohms differential B - TIA/EIA-422 (RS-422) - 120 ohms differential, even when unit powered off
Randomizer	15-stage LFSR, per IRIG 106. Selectable for bypass or enable
Environmental Section	
Operating temperature	-40°C to +85°C (1 W, 2 W, 5 W, and 10 W nanoTX models; 10 W nanoPuck)
Non-operating temperature	-55°C to +100°C (all models)
Operating humidity	0 to 95% (non-condensing)
Altitude	Up to 100,000 ft.

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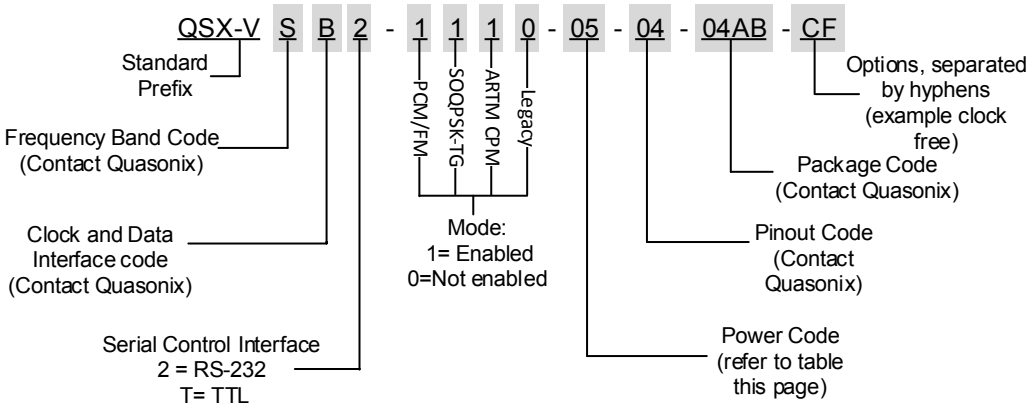


nanoTX™ TRANSMITTER SPECIFICATIONS

Characteristic	Specification
Physical Section	
Dimensions	nanoTX 01Ax packages: 1.275 in^3, 1.250" (W) x 3.400" (L) x 0.300" (H) nanoPuck 01Px packages: 1.280 in^3, 2.300" (Dia) x 0.325" (H)
Vibration	19.6 G (RMS) random, 20 Hz to 2,000 Hz, 3 axes
Shock	60 G (PK), 1/2 sine, 5 ms duration, 3 axes
Acceleration	100 G, 3 axes
Connector - RF	nanoTX (all packages): Female MMCX nanoPuck (all packages): Female MMCX
Connector – Baseband / Primary	nanoTX 01Ax package: Female 15 Pin or 21 pin nano nanoPuck 01Px package: SAMTEC FTSH-108-04-F-D

TIMTER™, nanoTX™, and nanoPuck™ PART NUMBERING

Transmitter Part Numbering Example



Power Code¤	Output Power¤
01¤	1·W¤
02¤	2·W¤
05¤	5·W¤
10¤	10·W¤
20¤	20·W¤
25¤	25·W¤

Contact Quasonix for detailed descriptions of codes, packages, and options

SAMPLE nanoTX™ PACKAGES



nanoTX 01Ax



nanoPuck 01Px

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TIMTER™ OPTIONAL FEATURES

>	AC	Automatic Carrier Wave Output
>	AI	Auxiliary Input for digital data that is already premod filtered
>	AP	Adapter Plate (hardware accessory)
>	BRx	Baud Rate
>	C7	Quasonix interpretation of IRIG 106-17 Appendix 2-C serial control protocol
>	CE	Convolutional Encoder (k=7 rate 1/2)
>	CF	Clock-free Baseband Interface
>	CG	Clock Generator Output to Baseband Connector
>	DP	Dual Power, 64 settings, user selects one for “high” and one for “low”, chosen via baseband conn. pin
>	EN	Ethernet Payload Capability
>	FM	Allows the TIMTER™ to function as an analog FM transmitter
>	FO	Frequency Offset
>	GN	GPS Notch (lowers noise at L1 and L2)
>	HR	High Bit Rate - Increases default max bit rate to 46 Mbps (23 Mbps for Tier 0)
>	ID	Internal Clock and Data can be saved as a power-up default
>	LC	Low current in the RF Off state, < 10 mA (hdw opt.)
>	LD	FEC / Low Density Parity Check (LDPC)
>	LD6	Extended LDPC
>	LR	Low Bit Rate - Decreases default min bit rate to 50 kbps (25 kbps for Tier 0)
>	MA	Below Lower S band, 2025.0 MHz to 2110.0 MHz (for Space operation and Space research applications)
>	MK	Randomizer Hardware Control (hardware option)
>	MS	Modulation Scaling
>	P9	MDM-9 Accessory Board (hardware accessory)
>	PF	Parallel Port Frequency Programming
>	PM	Parallel Port Mode Selection
>	PS	Hardware Preset (PS2, PS4, PS8, or PS16)
>	PW020	RF Output 20 mW (+13 dBm) (Order Power Code 00)
>	RH	Recall Holdoff
>	STDN	Supports Spacecraft Tracking and Data Network (PM/ BPSK) mode
>	SWBX	Switch Box (hardware accessory)
>	VF	Variable FIFO Depth, controls transmitter latency
>	VP	Variable power (31 settings, spanning 24 dB)
>	WV	Wide input voltage range

For additional information, contact Quasonix.

nanoTX™ OPTIONAL FEATURES

>	AC	Automatic Carrier Wave Output
>	BRx	Baud Rate
>	C7	Quasonix interpretation of IRIG 106-17 Appendix 2-C serial control protocol
>	CE	Convolutional Encoder (k=7 rate 1/2)
>	CF	Clock-free Baseband Interface
>	DP	Dual Power, 64 settings, user selects one for “high” and one for “low”, chosen via baseband connector pin
>	FO	Frequency Offset
>	GN	GPS Notch (lowers noise at L_1 and L_2)
>	HR	High Bit Rate - Increases default max bit rate to 46 Mbps (23 Mbps for Tier 0)
>	ID	Internal Clock and Data can be saved as a power-up default
>	LC	Low current in the RF Off state, < 10 mA (hdw option)
>	LD	Forward Error Correction / Low Density Parity Check
>	LD6	Extended Low Density Parity Check (LDPC)
>	LR	Low Bit Rate - Decreases default min bit rate to 50 kbps (25 kbps for Tier 0)
>	MS	Modulation Scaling
>	PS	Hardware Preset (PS2, PS4, PS8, or PS16)
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TRANSMITTER ACCESSORIES

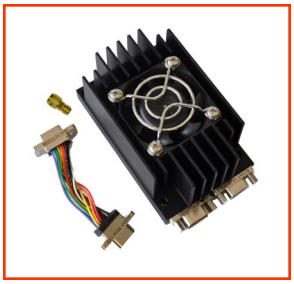
Characteristic	Specification

- ***Handheld Programmer (P/N: QS-PROG0021050) (at right)***
  Ruggedized and waterproof TDS Nomad Pocket PC with custom Quasonix user interface for convenient in-field programming via RS-232 control interface



- ***Adapter Plate (P/N: QSX-AC-AP96)***
  Adapts the 2" x 3" TIMTER™ transmitter footprint to a larger 2.5" x 3.5" mounting footprint

- ***Fan-Cooled Heat Sink (P/N: QSX-AC-32-HS-12V)***
  Heat sink with fan for TIMTER™ and nanoTX™ models. Includes power supply for North American operation.

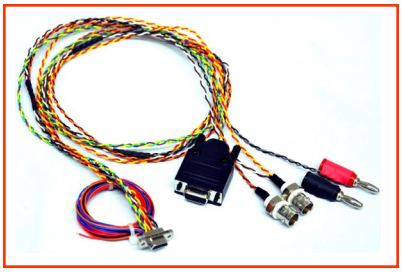


- ***Transmitter-powered Heat Sink (P/N: QSX-AC-32-HS-28V-SP)***
  Heat sink with integral fan, power supply, and temperature-controlled power on at +37°C. Draws power directly from a TIMTER™ transmitter. External power supply not needed

- ***MDM-15 Connector and Pigtails (P/N: QSX-AC-MDM15-36-PIN or QSX-AC-MDM15-36-SOCK)***
  Mating connector prewired with 36" non-terminated, color-coded pigtail cables for transmitter connections. Pin connector required for standard RS-422 transmitters, socket connector for standard TTL transmitters



- ***MDM-15 Wiring Harness (P/N: QSX-AC-MDM15-HARNESS-PIN or QSX-MDM15-HARNESS-SOCK)***
  Mating connector prewired and terminated with BNC connectors for clock and data, banana plugs for power and ground, and a DB-9 connector for serial control. Pin connector required for standard RS-422 transmitters, socket connector for standard TTL transmitters



- ***2nd Generation Digital Frequency and Mode Switch Box (P/N: QSX-AC-DSWBX)***
  Small aluminum digital switch box for use with transmitters equipped with the 9-pin parallel port. Provides frequency and mode programming capability. LED display supports modes 0-14 and five frequency digits. Channel selector for use with Quasonix Dual Transmitters.



- ***USB to Serial Adapter (P/N: QSX-AC-USBSER-CONV)***
  Converts USB interface to serial interface for controlling transmitters from a PC that does not have a DB-9 connector



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