

Multi-Mode Telemetry Transmitters



Fourth-Generation Powerhouse

Quasonix digital multi-mode telemetry transmitters are the benchmark of the industry, providing unparalleled performance and value in small, robust, power-efficient packages. We offer proven quality, with over 17,000 transmitters shipped. Quasonix is... Reinventing Telemetry™.

TIMTER™

Advanced Engineering – TIMTER fourth-generation transmitters have a faster processor, improved frequency stability, and support for all six LDPC codes.

- LDPC forward error correction mode improves link margin, nearly tripling the operating distance of your telemetry link. Adopted by the Range Commander's Council, IRIG 106-17, Appendix 2-D.

Band Combinations for All Your Needs

- L, S, or C Band TIMTER - When only single-band operation is needed.
- 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 18 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.

Exceptional DC-to-RF Conversion Efficiency – Facilitates replacement of older 10 W transmitter with new 20 W transmitter at same current draw.

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.

nanoTX™ and nanoPuck™

Smallest ARTM Transmitters – The 1.4 in³ nanoTX and nanoPuck transmitters are ideal for applications with strict SWaP constraints. Available in S band, up to 5 W.

All Quasonix Transmitters

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.

TIMTER Transmitter Specifications

Performance									
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	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
<p>All frequency bands may be tuned 0.5 MHz above or below the stated frequency.</p> <p>Note: The MA option enables operation below Lower S band frequencies in the tuning range of (2025.0 MHz to 2110.0 MHz) for use in Space operations and Space research.</p> <p>For additional information about this option or about specific frequency bands, contact Quasonix.</p> <p>Custom frequency ranges are available. Contact Quasonix for details.</p>	A			✓					25 W
	B						✓	✓	18 W
	C					✓			18 W
	D					✓	✓		18 W
	E	✓	✓	✓	✓	✓	✓	✓	10 W
	F			✓	✓	✓			18 W
	G							✓	18 W
	H	✓				✓			18 W
	J					✓	✓	✓	18 W
	K			✓	✓	✓	✓	✓	10 W
	L	✓							20 W
	M	✓	✓	✓	✓				20 W
	N				✓				25 W
	Q	✓	✓	✓	✓	✓	✓		10 W
	S			✓	✓				20 W
	T	✓				✓	✓		18 W
	V			✓	✓	✓	✓		18 W
	W			✓	✓		✓	✓	18 W
	X						✓		18 W
	Y	✓	✓			✓	✓		18 W
	Z	✓					✓	✓	18 W
RF output power	<p>TIMTER L, S, C, L/S, L/C and S/C bands: 10 mW, 1 W, 2 W, 5 W, 10 W, 18 W, 20 W</p> <p>TIMTER S band: 10 mW, 1 W, 2 W, 5 W, 10 W, 20 W, 25 W</p> <p>TIMTER L/S/C band: 10 mW, 10 W</p> <p>Option DP: Dual power, 64 settings, user selects one for "high" and one for "low", chosen via baseband connector pin</p> <p>Option VP: Variable power, 64 settings approximately 0.5 dB apart</p> <p>Note: Some older transmitter models have 32 1.0 dB steps. Contact Quasonix for additional information.</p>								

Performance (Continued)

Data (bit) rate, automatic rate adaptation	TIMTER: TIMTER option HR: TIMTER option LR:	0.1-28 Mbps (0.05-14 Mbps for PCM/FM) Extends upper limit to max of 46 Mbps for SOQPSK and ARTM CPM (23 Mbps for PCM/FM) 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: With BR A command:	Allows user to enter a fixed bit rate in the range defined in the Data (bit) rate specifications above 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	TIMTER L or S band, 10 mWatt	0.30 A max. 0.25 A typical
	TIMTER L or S band, 5 Watt	1.0 A max. 0.85 A typical
	TIMTER L or S band, 10 Watt (2in3 packages)	1.4 A max. 1.1 A typical
	TIMTER L or S band, 10 Watt (> 2in3 packages)	1.8 A max. 1.5 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/S band, 18 or 20 Watt	3.2 A max. 2.8 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, 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 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, 10 Watt	2.2 A max. 2.0 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, 10 Watt	2.5 A max. 1.8 A typical
Input voltage	Standard: +28 ± 4 VDC With optional wide voltage (WV option): +8.0 to +34 VDC for 10 mW, 1 W, 2 W models, all band combinations +12 to +34 VDC for 5 W model, all band combinations +21 to +34 VDC for 10 W, all band combinations except band codes F, H, K, Q, V, T, W, Y, and Z +24 to +34 VDC for 18 W and 20 W models, band codes A, L, N, S, and M only +24 to +34 VDC for 25 W models, band codes A and N only	
Power reversal	Reverse voltage protection	
Serial Control interface	2 - RS-232 serial control interface T - TTL serial control interface 4 - RS-422 serial control interface 6 - RS-422, 120 ohms differential, even when unit is powered off	

Clock and Data signal interfaces Serial data with separate synchronous clock Input impedances are only specified when unit is powered On, unless explicitly 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 minimum resolution unless FO option is installed, then 1Hz minimum
Carrier frequency accuracy	± 2.0 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 CCSDS randomizer available if extended LDPC (LD6 option) is installed and enabled

Environmental

Operating temperature	-40°C to +85°C (10 mW, 1 W, 2 W, 5 W, 10 W models) -40°C to +70°C (18 W non-S/C, 20 W, 25 W) -40°C to +60°C (18 W S/C band)
Storage temperature	-55°C to +100°C (all models)
Operating humidity	0 to 95% (non-condensing)
Altitude	Up to 100,000 ft.

Physical

Dimensions	TIMTER Package	Volume	Width	Length	Height
Typical sizes of transmitters listed. For the latest information about your transmitter package code, visit www.quasonix.com/resources .	02XX	2.40 in ³	2.00"	3.00"	0.40"
	04XX	4.50 in ³	2.00"	3.00"	0.75"
	05XX	4.50 in ³	2.00"	3.00"	0.75"
	06XX	6.07 in ³	2.00"	3.00"	1.01"
	07XX	6.55 in ³	2.00"	3.00"	1.09"
		6.67 in ³	2.00"	3.00"	1.11"
	08XX	7.59 in ³	2.00"	3.00"	1.00"
		8.42 in ³	2.00"	3.00"	1.40"
	09XX	9.18 in ³	2.00"	3.00"	1.53"
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 for TTL or female for RS-422 interface)				

nanoTX Transmitter Specifications

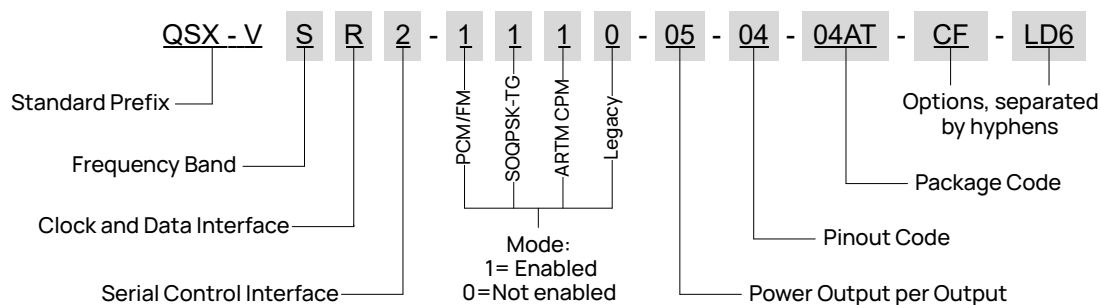
Performance				
Modulation type	PCM/FM (ARTM Tier 0), SOQPSK-TG (ARTM Tier I), Multi-h CPM (ARTM Tier II), BPSK, QPSK, OQPSK, UQPSK			
Carrier frequency tuning range All nanoTX models	Lower S band		Upper S band	
	2200.5 - 2300.5 MHz		2289.5 - 2394.5 MHz	
RF output power	nanoTX and nanoPuck: 1 W, 2 W, and 5 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, 64 settings approximately 0.5 dB apart Note: Some older transmitter models have 32 1.0 dB steps. Contact Quasonix for additional information.			
Carrier frequency tuning increment	0.5 MHz			
Carrier frequency accuracy	± 2.0 ppm over temperature ± 6.0 ppm, all causes, including aging over 5 years			
Data (bit) rate, automatic rate adaptation	nanoTX, nanoPuck: nanoTX option HR: nanoTX option LR:	0.1-28 Mbps (0.05-14 Mbps for PCM/FM) Extends upper limit to max of 46 Mbps (23 Mbps for PCM/FM) 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): +8.0 to +34 VDC for 1 Watt models +8.0 to +34 VDC for 2 Watt models +12 to +34 VDC for 5 Watt models			
Input current @ +28 VDC	nanoTX, nanoPuck nanoTX, nanoPuck nanoTX, nanoPuck	1 Watt 2 Watt 5 Watt	450 mA max; 570 mA max; 1.0 A max;	350 mA typical 480 mA typical 800 mA typical
Power reversal	Reverse voltage protection			
Control interface	1 - LVTTTL serial control interface (nanoPuck) 2 - RS-232 serial control interface (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	
Operating temperature	-40°C to +85°C (all models)
Storage temperature	-55°C to +100°C (all models)
Operating humidity	0 to 95% (non-condensing)
Altitude	Up to 100,000 ft.

Physical

Dimensions	nanoTX 01Ax packages: 1.40 in ³ , 1.25" (W) x 3.40" (L) x 0.33" (H) nanoPuck 01Px packages: 2.30" (Dia) x 0.33" (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 Example



TIMTER Optional Features

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

nanoTX Optional Features

AC:	Automatic Carrier Wave Output	LC:	Low current in the RF Off state, < 10 mA (hdw option)
BRx:	Baud Rate	LD:	Forward Error Correction / Low-Density Parity Check
C7:	Quasonix interpretation of IRIG 106-17 Appendix 2-C serial control protocol	LD6:	Extended Low-Density Parity Check (LDPC)
CE:	Convolutional Encoder (k=7 rate 1/2)	LR:	Low Bit Rate - Decreases default min bit rate to 50 kbps (25 kbps for Tier 0)
CF:	Clock-free Baseband Interface	MS:	Modulation Scaling
DP:	Dual Power, 64 settings, user selects one for "high" and one for "low", chosen via baseband connector pin	PS:	Hardware Preset (PS2, PS4, PS8, or PS16)
FO:	Frequency Offset	STDN:	Supports Spacecraft Tracking and Data Network (PM/ BPSK) mode
GN:	GPS Notch (lowers noise at L1 and L2)	VF:	Variable FIFO Depth controls transmitter latency
HR:	High Bit Rate - Increases default max bit rate to 46 Mbps (23 Mbps for Tier 0)	VP:	Variable power (31 settings, spanning 24 dB)
ID:	Internal Clock and Data can be saved as a power- up default	WV:	Wide input voltage range

Transmitter Accessories



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



Bench 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.



Airborne IntelliCool™ 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 transmit- ter connections. Pin connector required for standard RS-422 transmitters, socket connect- or 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, bana- na plugs for power and ground, and a DB-9 connector for serial control. Pin con- nector 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 sup- ports 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

Quasonix

All Quasonix products are under U.S. Dept. of Commerce jurisdiction. Transmitters are categorized as EAR99.
ISO 9001:2015 Certified | Specifications subject to change without notice.

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