

FTSU - FREQUENCY AND TIME SYNTHESIS DISTRIBUTION UNITS



**Low Phase Noise, Programmable Frequency and
Time Signal Synthesis / Distribution Units**

FTSU 100, 100B, 100C, 100D & 200



AS9100D Certificate Number : C0210021-AS3



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Product Overview



The FTSU range of signal distribution products provide precision programmable frequency and pulse signal amplification, synthesis and distribution in a variety of commonly utilised combinations. These devices deliver favourable performance in high integrity applications such as secure communications systems, satellite ground stations and digital television broadcasting where long term reliability and signal quality are depended upon.

The standard FTSU accepts two sets of input signal source normally comprising 1PPS and the reference frequency (typically 10MHz) delivering automatic “hitless” reference changeover should one of the continuously monitored on-line sources fail. Each input reference can be automatically selected by a status signal from the source or manually selected from the front panel or remote Ethernet interface on programmable variants.

The reference frequency outputs are generated and cleaned up by a low phase noise oven controlled quartz oscillator (OCXO) that is phase-locked to the reference frequency input. In the event of a reference input failure, the phase-locked oscillator will continue to provide referenced frequency outputs with a stability of 3×10^{-9} over temperature. Changeover between input references is smooth with no glitch on the output.

Typically 5 and up to 8 (D Variants) synthesized outputs are available at 1MHz, 5MHz, 10MHz and 64.8MHz as OCXO phase locked derivatives of the reference signal. Further user specific signal configurations can be achieved with selectable PCB links. Other synthesised signal frequencies are available upon request.

User control of ‘D’ variant units is via a user friendly built-in Web Browser with user-friendly graphical interface, or via SNMP for system applications. A 10/100 BaseT Ethernet interface provides full control over the functionality of the system, including reference reflection, output amplitude adjustment (on a per channel basis), 1PPS propagation delay adjustment (on a per channel basis).

In addition to reference frequency and pulse signal inputs, the FTSU range can also be configured to provide modulated time code signal distribution. A combination of factory setup options and internal links make these units highly flexible and configurable for specific applications. Please consult our sales teams for further information.

Front panel indicators show the status of the input selection and output condition along with power status indication. Each of the outputs is continually monitored and should an output fail for any reason, then a group alarm fault indicator will illuminate and trigger a rear panel fault alarm signal that may be used by external equipment to modify the reference and output signal routing and selection.

Key Feature Summary

Options & Features	
<ul style="list-style-type: none"> • 1MHz, 5MHz, 10MHz & 64.8MHz Dual Reference Frequency Inputs with Auto Failover • Low Phase Noise Reference “Cleaned Up” Frequency Outputs with “Hitless” zero glitch changeover • Programmable per channel amplitude adjustment via Ethernet interface (D versions) • Programmable per channel propagation delay adjustment of 1PPS (D versions) • 1U 19” rack mount : Automatic or manual reference signal selection with fault alarm outputs 	
Signals	
<ul style="list-style-type: none"> • FTSU100 : 5 x 1PPS + 5 x 10MHz : • FTSU100B : 5 x 1PPS + 10 x 10MHz + 7 x 64.8MHz • FTSU200 : 5 x 1PPS + 10 x 10MHz + 7 x 5MHz + 12 x IRIG B (2U chassis) • FTSU100D : 8 x 1PPS + 8 x 5MHz + 8 x 10MHz or 8 x 1PPS + 16 x 10MHz (programmable) • Synthesised output frequencies (Standard and custom version available) • Two reference signal inputs with automatic switching • Modulated Time Code Distribution options • Fault status indication and fault driven reference changeover 	<ul style="list-style-type: none"> • FTSU100A : 5 x 1PPS + 5 x 10MHz + 8 x 64.8MHz • FTSU100C : FTSU100B with enhanced O/P filter

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Specifications Note : Products are readily configurable for special requirements - please contact Sales for assistance

Input Specifications - FTSU-100x & FTSU-200

Reference Frequency Inputs	Details
Connectors	2 x Rear panel SMA/QMA
Amplitude	0.5 V to 1.0V RMS - Nominally factory set at 1V RMS - Transformer coupled
Input Impedance	50 Ohms
Frequency	10 MHz +/- 5PPM
1PPS Inputs (Optional)	
Connectors	2 x Rear panel SMA/QMA
Amplitude	1.0 V to 5.0V Vpp
Input Impedance	50 Ohms nominal
AC Time Code Inputs (Optional)	
Number of inputs	2 x Rear panel SMA/QMA
Amplitude	3.3V
Input Impedance	> 5K
Fault Discrete Inputs (Optional)	
Number of inputs	2
Connector	9 Way D Type Socket
Level	TTL
Active Level	Link selectable, high or low to force reference changeover

Output Specifications - FTSU-100x & FTSU-200

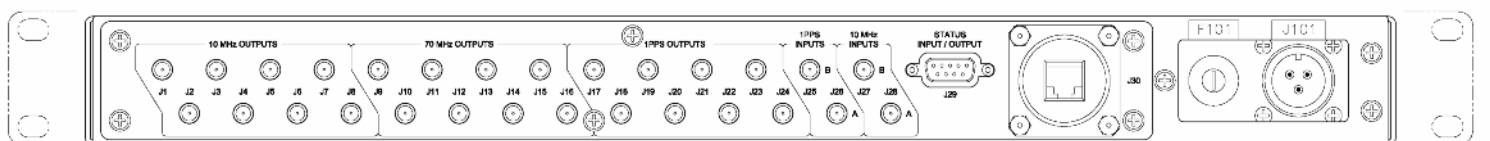
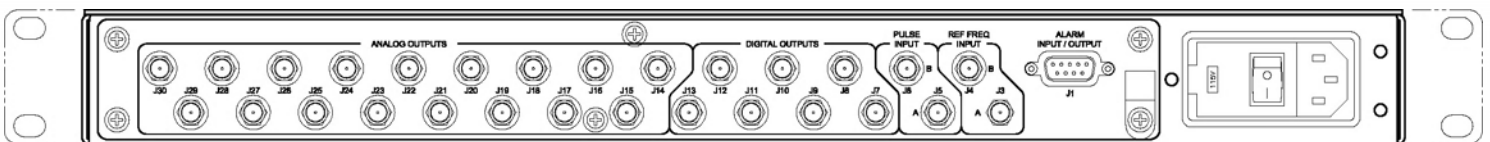
Reference Frequency Outputs	FTSU-100	FTSU-100A	FTSU-100B	FTSU-100C	FTSU-100D	FTSU-200
Part Number	001-0088	001-0062A	001-0133	001-0151	001-0280 / 0211	001-0080
Number of outputs	8 x SMA	8 x SMA	8 x SMA	8 x SMA	8 x QMA	10 x SMA
Frequency (MHz)	Same as input, 5 or 10 MHz					
Level dBm into 50 Ohms	+13 +/- 2	+13 +/- 2	+13 +/- 2	+13 +/- 2	+5 to +13 (adj)	+13 +/- 2
Stability without input	Temperature: $\pm 3 \times 10^{-9}$ from 0 - 60°C / Aging: 5×10^{-7} per year					
Synthesised Outputs						
Number of outputs	5 x SMA	5 x SMA	5 x SMA	5 x SMA	8 x QMA	7 x SMA
Frequency (MHz)	Synthesised 1, 5, 10 & 64.8MHz or customisable per customer request					
Level dBm into 50 Ohms	+13 +/- 2	+13 +/- 2	10 +/- 1	10 +/- 1	+8 to +15 (adj)	+13 +/- 2
Stability without input	Temperature: $\pm 3 \times 10^{-9}$ from 0 - 60°C / Aging: 5×10^{-7} per year					
User Link Selectable Outputs						
Number of link selected outputs (Reference or synthesised signals)	4 x SMA 5 or 10 MHz	4 x SMA 5,10 & 64.8MHz	4 x SMA 5,10 & 64.8MHz	4 x SMA 5,10 & 64.8MHz	8 x QMA 5,10 & 70MHz	Not Applicable
Level dBm into 50 Ohms	+13 +/- 2	+13 +/- 2	+10 +/- 2	+10 +/- 2	+10 +/- 2	Not Applicable
Optional AC Time Code Outputs						
Alternative order options to replace synthesised and link selectable outputs	8 x SMA	8 x SMA	5 x SMA	5 x SMA	Not Applicable	12 x SMA
Signal Level (Volts) into 50 Ohms	2V +/- 0.25V	2V +/- 0.1V	2V +/- 0.25V	2V +/- 0.25V	Not Applicable	2V +/- 0.25V
Pulse Outputs						
Number of outputs (20µs width)	5 x SMA	5 x SMA	5 x SMA	5 x SMA	8 x QMA	5 x SMA
Signal Level (Volts) into 50 Ohms	0 - 4.5V +/- 0.5V	0 - 4.5V +/- 0.5V	0 - 4.5V +/- 0.5V	0 - 4.5V +/- 0.5V	0 - 4.5V +/- 0.5V	0 - 4.5V +/- 0.5V
SSB Phase Noise @ 10 MHz						
1 Hz	-90 dBc					
10Hz	-115 dBc					
100Hz	-140 dBc					
1KHz	-150 dBc					
10KHz	-155 dBc					
100KHz	-157 dBc					
Status Output - DB9 connector						
Logical OR of fault status indicators	Dry relay Contact Form C					
Signal Levels	Link set as either active high (5V) or active Low (0V)					

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Specifications - FTSU-100x & FTSU-200

Signal Noise Sources	Details
Harmonic Distortion	-30dBc - all units except FTSU-100C : FTSU-100C has improved filtering, see table below
Cross Talk	-60dBc - all units except FTSU-100C : FTSU-100C has improved filtering, see table below
Spurious	-80dBc - all units except FTSU-100C : FTSU-100C has improved filtering, see table below
Signal Noise Sources - FTSU-100C	
2 nd Harmonic Distortion	Typically -70dBc Guaranteed Max - 50dBc
3 rd Harmonic Distortion	Typically -70dBc Guaranteed Max - 60dBc
>= 4 th Harmonic Distortion	Typically -85dBc Guaranteed Max - 70dBc
Environmental	
Operating Temperature	0°C + 60°C
Humidity	95 % non condensing
Power	115VAC or 230VAC 50/60Hz < 40W
Network Interface	
Interface	RJ45 - 10/100BaseT
Protocols	NTP (RFC 1305), Telnet (RFC 854), FTP(RFC 959), DHCP (RFC 2132), Time (RFC 867), Daytime (RFC 867), and SNMP (RFC 1157)
Console Port	
Interface	9 Way D type socket 115K Baud - 115200, N, 8, 1
Physical	
Size	All units except FTSU-200 (2U) 19" Rack 1U 1.75" (H) x 7.5" (D) x 17" (W) [4.4 cm(H) x 19 cm (D) x 43.2 cm (W)] Weight : 7.5 lb (3.4 Kg)
Humidity	95 % non condensing
Power	115VAC or 230VAC 50/60Hz < 40W



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Asia, China, India, Japan

Mr Neil Pitman
Director of Sales - Asia
China, India, Japan

+44 (0) 1376 5141 14 Phone
neil.pitman@timefreq.com

Europe, Middle East, Africa, Australia

Mr David Wright
Director of Sales, Europe, Middle East,
Africa, Australia

Tel : +44 (0) 1694 722891
dwright@timefreq.com

United Kingdom

Mr Mark Aheme
Director of Sales, UK

Tel : +44 (0) 1376 5141 14
mark.aheme@timefreq.com

tfs Time & Frequency Solutions

25 Eastways, Witham, Essex, CM8 3AL, UK
Phone +44 (0) 1376 5141 14 | Fax +44 (0) 1376 5161 16
enquiries@timefreq.com

Brandywine
communications

153 Warner Ave, Tustin, CA 92780, USA
Phone +1 714 755 1050
Info@brandywinecomm.com

Please visit our web sites at www.brandywinecomm.com or www.timefreq.com or call one of our regional offices.

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