



Microstepper Combiner Synthesizer

VCH-317



Microstepper Combiner Synthesizer VCH-317, produces an uninterrupted in frequency and phase signal on the base of group atomic clocks. Operational principle of Combiner is based on frequency control of local crystal oscillator using multichannel phase comparator and digital processor. Digital control of output frequency performed by built-in processor provides such advantages as programming frequency and phase shifts of output signal with high resolution.

Key Applications

- ✦ time and frequency redundant systems;
- ✦ frequency and time keeping etalons.

Key Features

- ✦ Input & Output :-
 - Inputs: Up to 4 inputs of 5,10 or 100MHz;
 - Outputs: 5,10, 100MHz and 1 PPS (1 each).
- ✦ Combiner features (2 modes):-
 - Averaging mode— up to 4 inputs averaging in Phase and Frequency;
 - Switching mode— Switch in sequence of priorities of up to 4 inputs.
- ✦ Microstepper features:
 - Programmable output frequency offset. Range: $\pm 1.0 \times 10^{-8}$ (resolution 1.0×10^{-18});
 - Programmable Drift compensation. Range: $\pm 8.64 \times 10^{-12}$ /day (resolution 1.0×10^{-18});
 - Programmable output phase. Range: $\pm 999,999$ ps (resolution 1 ps).
- ✦ MCS automatically excludes input signal when:
 - The corresponding input signal physically “disappears”;
 - Input signals frequency difference exceeds programmed limit;
 - External ERROR signal from the input signal source.
 - **Note:** Under above circumstances, MCS holds output signal frequency and phase: frequency shift (RMS) $\leq \pm 2.0 \times 10^{-15}$ & phase shift $\leq \pm 1.0 \times 10^{-10}$ s.



VCH-317 Specifications

Inputs :

Wave-form	Qty	Signal Level	Freq. Diff. Limits	Rise	Type	Load
5/10/100 MHz (Sine)	4	1 ± 0.2 V _{RMS}	< 1x10 ⁻¹¹	-	SMA	50 Ω
1PPS (Sync. Signal)	1	2.5 - 5 V	> 1 μs	< 50 ns	SMA	50 Ω

Outputs :

Wave-form	Qty.	Signal Level	Pluse width	Rise	Load	Harmonics	Sync. Accuracy
5MHz (Sine)	1	1 ±0.2 V _{RMS}	-	-	50 Ω	< - 30dB	-
10MHz (Sine)	1	1 ±0.2 V _{RMS}	-	-	50 Ω	< - 30dB	-
100MHz (Sine)	1	1 ±0.2 V _{RMS}	-	-	50 Ω	< - 30dB	-
1 PPS (TTL)	1	2.5 - 5 V	10-50 μs	≤10ns	50 Ω	-	< 20 ns

Stabilty **	Allen Var.	Input & Output Max. relative Diff.		** Specified only under laboratory conditions: at ±0.5°C/ hour ambient temperature change in 10-40 °C operating temperature range ** Measured using 1 Hz bandwidth
1 s	≤1.0x10 ⁻¹³	≤1x10 ⁻¹²		
3,600s	≤1.0x10 ⁻¹⁵			
Phase Noise, L(f) dBc/Hz	5MHz	10MHz	Notes	
1Hz	PN ^{###}	PN ^{###}	### :If 1 input signal then ouput PN is practically the same as input siganl PN. If, more than 1 signals then output PN is the average of input signals PN.	
10Hz	-137 ^{###}	-131 ^{###}		
100Hz	< -155	< -150		
1000Hz	< -160	< -155		
10KHz	< -160	< -155		
Microstepper Functions		Range	Resolution	
Output Frequency adjust		±1.0 x10 ⁻⁸	1.0 x10 ⁻¹⁸	
Drift Compensation/ Day		±8.64 x10 ⁻¹²	1.0 x10 ⁻¹⁸	
Output Phase adjust		±999,999 ps	1ps	

General

Interfaces:	RS232C & USB (Only 1 inuse at a time).
Software:	Full data monitoring and functions control are performed manually by front panel or remotely via interfaces. Software for auto operation running under Win [®] 7 (Recom.)
Operating temp.:	+10°C to +40°C (Rate of change < ±0.5°C/Hr.)
Warm up period:	4Hrs.
Power Supply:	AC 220V ±10% @50 Hz
DC Power Supply:	22 – 30 VDC
Power consumption:	< 60 VA / < 50 W
Dimension 3U (WxHxD) :	483 x 133 x 380 mm
Weight:	~8 Kg



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