Pulse Distribution Unit

1 pps to 20 MHz, 1 input - 16 outputs, BNC

Part No: 10188 Issue 03

Key features:

- Compact design (1HU), rack mountable
- Short rise and fall times (t_r, $t_f \leq 1$ ns)
- Output to output skew: < 150 ps
- Matched to 50 Ohm, input impedance configurable to high impedance
- Usable for digital pulse distribution from 1 pps to 20 MHz
- AC and DC power supply inputs, automatic switch-over

The Pulse Distribution Unit is a one height unit rack mountable unit. It shows extremely short rise and fall times and provides 1 pps pulses to 16 outputs. The extreme fast rise and fall times and the very small channel to channel delay variation makes this unit ideal for high precision pulse distribution equipment. It accepts a wide range of input signal levels, since the input trigger level can be adjusted by an externally accessible selector switch providing 8 different trigger levels. The output levels are TTL signals (when not loaded) and 2.5 Vpp when loaded with 50 Ohm.

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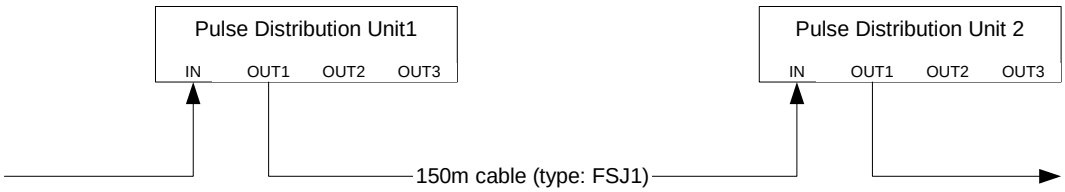
The unit is designed for the rising edge being the significant pulse reference. The typical 1 PPS (one pulse per second) signal has a pulse width of 20 µs. If any pulse signal is available at the input and if it is triggered correctly then the green input LED is active, i.e. the LED is switched on with every trigger event for some ten milliseconds. A similar supervision is at the output signals. If these are at nominal properties the green output LED is active. If no input signal is present or if any output signal failed then the red alarm LED is on.

Typical Waveforms

The performance of the unit is shown by the following measurement results. A 1 PPS signal source had been connected to a first Pulse Distribution Unit with a short cable. A second Pulse Distribution Unit had been connected to an output of the first one via a high stability co-axial cable (FSJ1) of 150 m length.

Measurement Setup:

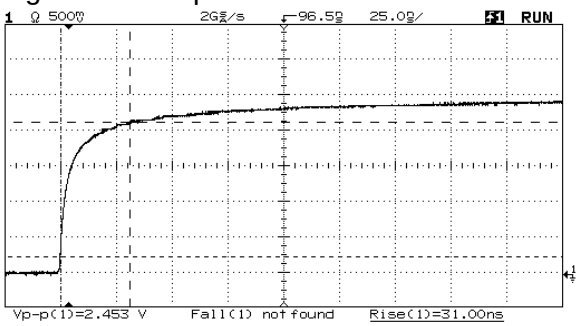


- Input to unit1: 1pps signal (20 µs width) from a 1 PPS generator (not shown in the diagram),
- Trigger level of unit 2 = 1,4V,
- Output of both units into 50 Ω load.

Measurement Result:

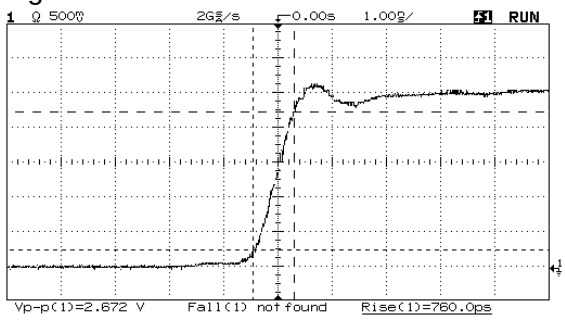
1. Pulse shape

Signal at the input of unit 2



Horizontal axis: 25 ns/unit
Vertical axis: 500 mV/unit

Signal at connector ”OUT1” of unit 2.



Horizontal axis: 1 ns/unit
Vertical axis: 500 mV/unit

2. Pulse jitter

Jitter with 150 m cable (FSJ1): <20 ps

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Data subject to change without notice.

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Specification

Signal Inputs

Number of inputs	1 (BNC)
Signal type	1 pps (pulse, DC coupled), to 20 MHz, max duty cycle 10 %
Input impedance	50 Ω / 2 kΩ, rotary switch positions 0..7: 2 kΩ, positions 8..F: 50 Ω
Input level	min. 0 VDC, max 10 VDC
Trigger level (0 **à** 1)	Selectable by 16 position rotary switch, an arrow indicates the switch position. Positions 0..7& 8..F: 5V; 4.4V; 3.7V; 3.1V; 2.5V 1.9V 1.2V, 0.6V
Significant slope	positive (negative upon request)

Signal Output

Number of outputs	16 (BNC)	
Output level	TTL (unloaded), 2.5 Vpp when loaded with 50 Ω	
Output impedance	50 Ω	
Significant slope	Signal non inverted	
Pulse duration	same as input, nominal 20 µs	
Rise / Fall time *)	≤ 1 ns	(800 ps typ)
Output jitter *)	≤ 20 ps	
Output to output skew *)	≤ 150 ps	(<100 ps typ)
Delay variation *)	≤ 3 ps	(all other outputs unloaded/loaded)
Outp./Outp. Coupling *)	≤ 1.5 ps	
Equipment Delay *)	20 ns ± 2 ns	
Temperature sensit. *)	10 ps / K (10°C to 35°C)	

*) measurement conditions: input: 1pps signal (20 µs width), output into a 50 Ω load

Electrical interface

Power Consumption	< 15 Watts	Priority on AC supply input, DC is used as back-up supply.
Supply Voltage AC	95 to 265 V AC, 47 to 65 Hz	
Supply Voltage DC	18 to 36 V DC, DC isolated	
	DC connector with 2 m cable included, IECV 61076-2-101 M8 (4 pins) (+) brown (1) & white (2), (-) blue (3) & black (4), polarity reversible	

Indicators

LED IN (green)	Input pulse present
LED OUT (green)	Output pulse nominal
LED Alarm (red)	“no input present” or “one or more outputs failed”
Connector Alarm	Lo-Z: Nominal operation, all output pulses present
(Open Collector Output)	Hi-Z: no input pulse, unit failed, unit not powered, “Alarm RED”
	Maximum voltage 5.5 V, (+) brown, (-) blue
	Alarm connector with 2 m cable included, IECV 61076-2-101 M8 (3 pins)

Mechanical

Outline	19 inch, 1 height units (448.8 mm ∗ 44 mm) depth 448 mm
Weight	5 kg

Environmental

Transportation and Storage	
Temperature.	-20°C to +75°C
Humidity	10% to 90% (non condensing)
Altitude	< 20 000 m
Shock	max 10g acceleration for 11 ms
Vibration	max. 0.15 mm at 5 to 8 Hz, max 1g acceleration at 8 to 500 Hz
Operation	
Temperature	-10°C to +50°C
Humidity	20% to 90% (non condensing)
Altitude	< 3 000 m

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