COM-1402 -> COM-1202

Objective: connect a digital PSK/QAM/APSK modulator and demodulator back to back. Observe the key signals, demodulator lock and error-free transmission of a pseudo-random test sequence.

Configuration: 8 Mbits/s, BPSK

First, let us configure the COM-1402 modulator as shown below:

😴 COM1402 PSK / QAM / APSK Digital Modulator 🔀								
Symbol rate: 8000000.005								
Modulation: BPSK								
Signal gain: 30000								
Ouput center frequency: 0 Hz								
Spectrum inversion								
Spectrum shaping filter bypass								
Insert periodic sync word								
Test mode: Pseudo-random sequence 💌								
Input: Left connector 1-bit serial 💌								
Input bus address: 0								
Output: 90 MSamples/s COM-2001 💌								
Apply Ok Advan Cancel								

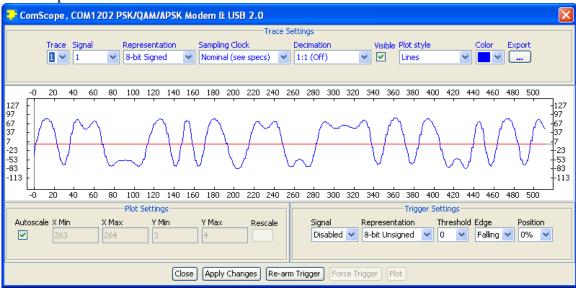
After configuring the COM-1402 modulator, observe the waveform at the output using ComScope:

2	ComScop	e, COM	A1402 P	SK / QAM	/ APSK D	igital Mo	dulator									X
	Trace Settings															
		Trace	Signal 4		esentation Signed		ng Clock al (see spec	5) 💌	Decimation 1:1 (Off)	۱ ۷		Plot style Lines	~	Color	Export	
127 87 47 -33 -73 -113		ſ	60 80	Ŵ	$\overline{\mathbf{A}}$	\bigvee			· ·		~/			Ņ	· · ·	00 127 87 47 7 -33 -73 -113
	-0 20	40	60 80			60 180	200 220	240 2	60 280	300 320	340 3		400 420	440 46	50 480 5	00
	Autoscale	X Min O	X M 51		tings Y Min O	Y Max 256	Resca	e		nal sabled 💌	Represe 8-bit Ur	ntation	r Settings- Thresh 0	old Edge Falling	Positio 9 🔽 0%	
	Close Apply Changes Re-arm Trigger Force Trigger Plot															

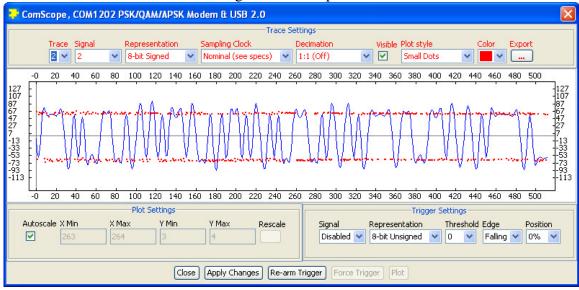
Then we configure the COM-1202 demodulator section:

😴 COM1202 PSK/QAM/APSK Modem & USB 2.0 Basic Settings 🛛 🛛 🔀								
Modulation								
Symbol rate: 0	Modulation: BPSK							
Signal gain: 0	External transmitter gain: 255							
Ouput center frequency: 0 Hz	Spectrum inversion							
Spectrum shaping filter bypass								
Test mode: Disabled 💌	Input: USB							
Input format: 1-bit serial 💌	Input bus address: 0							
Output: Analog(J7 Bottom Connector)								
Demodulation								
Symbol rate: 8000000.005	Modulation: BPSK							
Input center frequency: 0 Hz	Spectrum inversion							
AFC enable: Automatic AFC selection 💙	Input: 2*10 digital 💌							
R× ADC gain: 10 dB	DC Bias removal							
Detect periodic sync word	AGC response time: 0							
Output: Synchronous serial J5 💌 🗌 4-bit soft quantization								
r General								
Test points: Demodulator & BER 💌								
Apply Ok Advan Cancel								

We can then observe the signals received at the COM-1202 demodulator input, using ComScope:



The demodulated bits (red dots) can also be observed using ComScope: the plot below shows that there is no intersymbol interference, perfect bit timing and no bit errors. The blue trace shows the demodulated signal at the output of the root raised cosine filter.



Since the COM-1402 is transmitting a pseudo-random binary sequence PRBS-11, the demodulator can measure the bit error rate. The BER synchronization appears as a 1 in status register SREG24. The BER count is zero in status registers SREG20 – SREG23.

СОМ1202 РЅК/QAM/APSK М... 🔀

	-	er values ir	1 HEX				
Status Re Register Register Register Register Register Register Register Register Register Register Register Register	gisters 0 : 00 1 : 00 2 : 00 3 : 00 4 : 00 5 : 07 6 : 07 7 : 07 8 : 0F	Register Register Register Register Register Register Register Register Register Register Register	21: 00 22: 00 23: 00 24: 01 25: 1F 26: 1F 27: 1F 28: 1F 29: 1F				
Register Register Register Register Register Register Register Register Register Register	10: 00 11: 00 12: 00 13: 00 14: 01 15: 00 16: F1 17: 01	Register Register Register Register Register Register Register Register Register	31: 00 32: 00 33: 00 34: 00 35: 00 36: 00 37: 00 38: 00 38: 00				
	Close						