RIGOL
Innovation or nothing

S1220 ASK/FSK Demodulation Analysis PC Software

DSA875/832/832E Series Spectrum Analyzer

RIGOL TECHNOLOGIES,INC.

Main Features

- Highlight reference symbols
- Support Manchester Encoding
- Display the waveform, eye diagram, symbol, and demodulation results in one interface
- Set the reference position of the waveform and eye diagram as required
- Provide single/continuous sweep modes, enabling you to observe the demodulation results at any time
- Load the saved configuration data and improve efficiency
- Provide demos for you to enjoy great user experience with the software, without connecting the instrument or obtaining a license

Key Applications and Field

- Tire pressure monitoring
- Car remote key signal demodulation
- Vehicle access control
- Garage door remote control
- The wireless medical monitoring (patient monitoring system)
- Remote meter reading
- Personal and consumer electronics
- ASK/FSK modulation signal demodulation scene

Technical Specifications and Support Models

ASK/FSK Demodulation Analysis	
Support Models： RIGOL DSA875/TG、DSA832/TG、DSA832E/TG	
Frequency range	5 MHz to 3.2 GHz/7.5 GHz
Carrier power accuracy	± 2 dB, nominal value
Carrier power range	–30 dBm to +20 dBm, nominal value
Carrier power display resolution	0.01 dBm
ASK Measurement	
Symbol rate range	1 kHz to 100 kHz
Demodulation depth	5% to 95%
Accuracy	± 4% of the reading value, nominal value
Display resolution	0.1%
FSK Measurement	
FSK deviation	1 kHz to 400 kHz
Symbol rate range	1 kHz to 12 kHz $1 \leqslant \beta \leqslant 32$, β is the radio of frequency deviation to symbol rate (deviation/rate) 12 kHz to 25 kHz $1 \leqslant \beta \leqslant 16$ 25 kHz to 50 kHz $1 \leqslant \beta \leqslant 8$ 50 kHz to 100 kHz $1 \leqslant \beta \leqslant 4$
Accuracy	± 4% of the reading value, nominal value
Display resolution	0.01 Hz

Example of measurement solution

This section takes FSK signal as an example to demonstrate how to operate S1220 ASK–FSK Demodulation Analysis, and briefly introduces the way to output demodulation signals by using RIGOL's RF generator.

In the demonstration, a FSK signal is generated, and its parameters are as follows:

- Carrier frequency: 433.92MHz, carrier frequency amplitude:–26 dBm
- FSK symbol rate: 9.6 Ksym/s, peak–to–peak carrier frequency offset: 80 kHz
- Baseband waveform code pattern: 1110000110

The procedures for validating the FSK signal by using the S1220 ASK–FSK DEmodulation Analysis software are as follows:

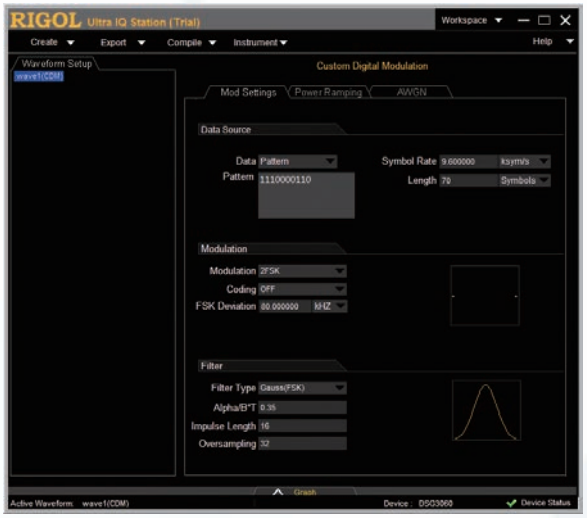
Step 1: Set DSG3000 and IQ Station to generate FSK signals

1.Run Ultra IQ Station on your PC, and then connect DSG3000 RF Generator to the software (You can download the software from www.rigol.com. For the software operation, refer to the help documentation of Ultra IQ Station).

2.Set the following parameters in the IQ Station interface:

- Symbol Rate: 9.6 Ksym/s
- Pattern: 1110000110
- Modulation: 2FSK
- FSK Deviation: 80 kHz

3. In the IQ Station interface, click Compile to select "Compile". Then, you can compile the set data.



4. Set the parameters for DSG3000 RF Generator. Set its output signal frequency to 433.92MHz, output signal level –26 dBm.

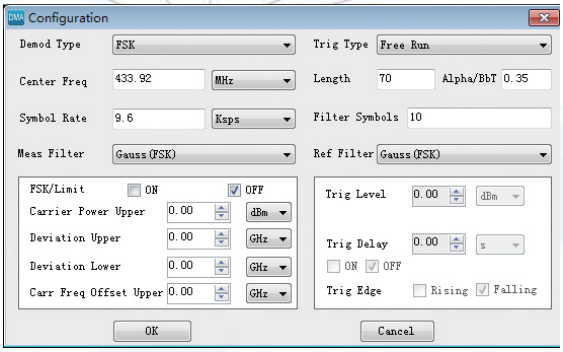
5. In the IQ Station interface, click Compile to select "Run". Then, load the successfully compiled waveform table to DSG3000 to output the modulation signal.

Step 2: Set DSA800 and S1220 to demodulate and analyze the FSK signals.

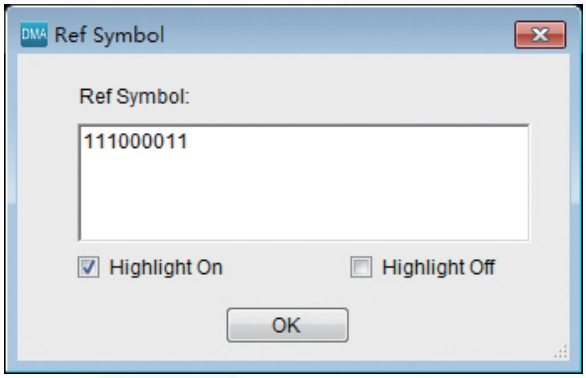
1. Set the spectrum analyzer to DMA mode. Press Meas → DMA to enter the DMA mode.

2. Start the S1220 software, and then connect the spectrum analyzer to the software to build communication.

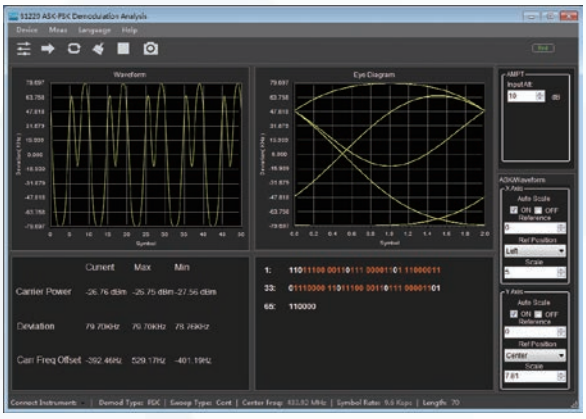
3. Click Meas → Demodulation Configuration. Then, the "Configuration" interface is displayed. In the displayed interface, configure the parameters, as shown in the following figure.



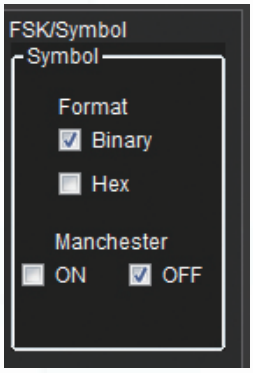
4. Click Meas Ref Symbol to set the reference symbol. If "Highlight On" is selected, the symbols that are consistent with the reference symbol will be indicated in orange in the symbol display area; if "Highlight Off" is selected, no highlight will be indicated for the symbols.



5. Obtain the measurement results.



6. Click the symbol display area. Then, the symbol setting is displayed at the right section of the interface. You can select "Binary" or "Hex" as the display format of the symbol. You can also select "ON" or "OFF" to determine whether to display the symbol in Manchester encoding.



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