

## QPSK Demodulator & Bit Synchronizer Model No: JC-SC-DB12



The QPSK Demodulator and Bit Sync Unit has been designed to meet the Data Reception requirements for the Remote Sensing Satellite Ground Stations. This system receives a QPSK Modulated IF signal of 720 MHz as its input and output the Demodulated I and Q base-band signals for the baseband data-rate upto 105 Mbps. The Bit Synchronizer receives the Demodulated I & Q base-band as it's input and outputs the Clock and Synchronized Data for both I & Q with Parallel Clock (52.5 MHz) and the serial data at 105 Mbps along with Serial Clock.

## **Applications**

- In-Radio communication for demodulation
- Orbiting satellite tracking for remote sensing

## **Features**

- High Data rate demodulators for ground checkout / Earth stations
- Digital Costas loop & DSP based processing
- QPSK Demodulation
- Data rate 10 Mbps to 105 Mbps (Upgradable to 320 Mbps)
- 60 dB dynamic range
- Configurable for different differential decoding algorithms
- Digital Bit-synchronizer (160Mbps- I & Q), Clock & Data Outputs





www.jisnu.com

## **Technical Specifications**

Input Frequency     720 MHz       AGC Dynamic range     -10 to -50 dBm (40dB)       Demodulation Scheme     QPSK       Data Rate     Upto 105 Mbps (Upgradable to 320 Mbps)       Acquisition Time     -250msec       Acquisition Range     ± 500 KHz       Doppler Rate Capability     up to 8 KHz/sec       BER Performance     Within 2.0dB of the theoretical Eb/No for a BER of 1x10-6       Input Data Format     PCM NRZ-M       Differential Decoding     4 state gray coded (1 RS Specific) Programmable       Clock Acquisition     ± 0.3% of Symbol rate       Outputs     I channel -Data, Clock, Inverted Clock, Inverted data, O channel -Data, Clock, Inverted Data & Clock       Output Logic     NRZ-L ECL Single ended (Un-terminated)       Clock Duty Cycle     50% ± 10%       Continuous Clock Stability     Better than ± 10 PPM       Front Panel Indication     Carrier, Clock & Local / Remote       Front Panel Display     Frequency, RSSI, Data rate & Decoding       Front Panel Selections     Decoding, Phase adjust, IP Configure       Input/Output Connectors     BNC(F)       Remote Interface     50 ohms       Input/Output Connectors     BNC(F)       Remote Interface     230V AC, 50 Hz, Single Phase       Mechanical     U       Mounting     19-inch 3U Rack mountable       Size	Functional	
Demodulation SchemeQPSKData RateUpto 105 Mbps (Upgradable to 320 Mbps)Acquisition Time<250msec	Input Frequency	720 MHz
Data RateUpto 105 Mbps (Upgradable to 320 Mbps)Acquisition Time<250msec	AGC Dynamic range	-10 to -50 dBm (40dB)
Acquisition Time<250msecAcquisition Range± 500 KHzDoppler Rate Capabilityup to 8 KHz/secBER PerformanceWithin 2.0dB of the theoretical Eb/No for a BER of 1x10-6Input Data FormatPCM NR2-MDifferential Decoding4 state gray coded (I RS Specific) ProgrammableClock Acquisition±0.3% of Symbol rateOutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNR2-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output ConnectorsBNC(F)Remote InterfaceS00 vAC, 50 Hz, Single Phase <b>Betertical</b>	Demodulation Scheme	QPSK
Acquisition Range         ± 500 KHz           Doppler Rate Capability         up to 8 KHz/sec           BER Performance         Within 2.0dB of the theoretical Eb/No for a BER of 1x10-6           Input Data Format         PCM NRZ-M           Differential Decoding         4 state gray coded (I RS Specific) Programmable           Clock Acquisition         ±0.3% of Symbol rate           Outputs         I channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & Clock           Output Logic         NRZ-L ECL Single ended (Un-terminated)           Clock Duty Cycle         50% ± 10%           Continuous Clock Stability         Better than ± 10 PPM           Front Panel Indication         Carrier, Clock lock & Local / Remote           Front Panel Display         Frequency, RSSI, Data rate & Decoding           Input/Output Impedance         50 ohms           Input/Output Connectors         BNC(F)           Remote Interface         RS232 / TCP-IP (Selectable)           Electrical         Electrical           Mounting         19-inch 3U Rack mountable           Size         485 L X 485 D X 88 H in mm           Weight         <6 Kgs	Data Rate	Upto 105 Mbps (Upgradable to 320 Mbps)
Doppler Rate Capabilityup to 8 KHz/secBER PerformanceWithin 2.0dB of the theoretical Eb/No for a BER of 1x10-6Input Data FormatPCM NRZ-MDifferential Decoding4 state gray coded (I RS Specific) ProgrammableClock Acquisition±0.3% of Symbol rateOutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalVoutput Sult Ack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Acquisition Time	<250msec
BER PerformanceWithin 2.0dB of the theoretical Eb/No for a BER of 1x10-6Input Data FormatPCM NRZ-MDifferential Decoding4 state gray coded (I RS Specific) ProgrammableClock Acquisition±0.3% of Symbol rateOutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Acquisition Range	± 500 KHz
Input Data FormatPCM NRZ-MDifferential Decoding4 state gray coded (I RS Specific) ProgrammableClock Acquisition±0.3% of Symbol rateOutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output ConnectorsBNC(F)Remote Interface50 ohmsInput/Output ConnectorsBNC(F)Power230V AC, 50 Hz, Single PhaseMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Doppler Rate Capability	up to 8 KHz/sec
Differential Decoding4 state gray coded (I RS Specific) ProgrammableClock Acquisition±0.3% of Symbol rateOutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output ConnectorsBNC(F)Remote Interface500 VAC, 50 Hz, Single Phase <b>Betterical</b> 230V AC, 50 Hz, Single Phase <b>Mechanical</b> 19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	BER Performance	Within 2.0dB of the theoretical Eb/No for a BER of 1x10-6
Clock Acquisition±0.3% of Symbol rateOutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceBNC(F)Remote Interface230V AC, 50 Hz, Single PhaseMechanical19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Input Data Format	PCM NRZ-M
OutputsI channel -Data, Clock, Inverted Clock, Inverted data, Q channel -Data, Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalVertexMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Differential Decoding	4 state gray coded (I RS Specific) Programmable
Clock, Inverted Clock & Inverted Data I+Q (Merged) Data & ClockOutput LogicNRZ-L ECL Single ended (Un-terminated)Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)Electrical200V AC, 50 Hz, Single PhaseMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Clock Acquisition	±0.3% of Symbol rate
Clock Duty Cycle50% ±10%Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalPower230V AC, 50 Hz, Single PhaseMechanicalMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Outputs	
Continuous Clock StabilityBetter than ± 10 PPMFront Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalVolumePower230V AC, 50 Hz, Single PhaseMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Output Logic	NRZ-L ECL Single ended (Un-terminated)
Front Panel IndicationCarrier, Clock lock & Local / RemoteFront Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)Electrical230V AC, 50 Hz, Single PhaseMechanical19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Clock Duty Cycle	50% ±10%
Front Panel DisplayFrequency, RSSI, Data rate & DecodingFront Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)Electrical230V AC, 50 Hz, Single PhaseMechanical19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Continuous Clock Stability	Better than ± 10 PPM
Front Panel SelectionsDecoding, Phase adjust, IP ConfigureInput/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)Electrical230V AC, 50 Hz, Single PhasePower230V AC, 50 Hz, Single PhaseMechanical19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Front Panel Indication	Carrier, Clock lock & Local / Remote
Input/Output Impedance50 ohmsInput/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)Electrical230V AC, 50 Hz, Single PhasePower230V AC, 50 Hz, Single PhaseMechanical19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Front Panel Display	Frequency, RSSI, Data rate & Decoding
Input/Output ConnectorsBNC(F)Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalPower230V AC, 50 Hz, Single PhaseMechanicalMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Front Panel Selections	Decoding, Phase adjust, IP Configure
Remote InterfaceRS232 / TCP-IP (Selectable)ElectricalPower230V AC, 50 Hz, Single PhaseMechanicalMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 KgsEnvironmental	Input/Output Impedance	50 ohms
ElectricalPower230V AC, 50 Hz, Single PhaseMechanicalMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Input/Output Connectors	BNC(F)
Power230V AC, 50 Hz, Single PhaseMechanicalMounting19-inch 3U Rack mountableSize485 L X 485 D X 88 H in mmWeight<6 Kgs	Remote Interface	RS232 / TCP-IP (Selectable)
Mechanical         Mounting       19-inch 3U Rack mountable         Size       485 L X 485 D X 88 H in mm         Weight       <6 Kgs	Electrical	
Mounting     19-inch 3U Rack mountable       Size     485 L X 485 D X 88 H in mm       Weight     <6 Kgs	Power	230V AC, 50 Hz, Single Phase
Size     485 L X 485 D X 88 H in mm       Weight     <6 Kgs	Mechanical	
Weight <6 Kgs Environmental	Mounting	19-inch 3U Rack mountable
Environmental	Size	485 L X 485 D X 88 H in mm
	Weight	<6 Kgs
Temperature - Operating 0° C to +50° C	Environmental	
	Temperature - Operating	0° C to +50° C
Temperature - Storage-10° C to +60° C	Temperature - Storage	-10° C to +60° C
Humidity 90% RH Non-Condensing	Humidity	90% RH Non-Condensing



JISNU COMMUNICATIONS PRIVATE LIMITED #8-2-120/86/9/8, 2nd Floor, Luxor Park, Road No.2, Banjara Hills, Hyderabad - 500 034. Telangana, India, P: +91-40-23550762/23550742 | F: +91-40-2354 4346 | E: info@jisnu.com | www.jisnu.com