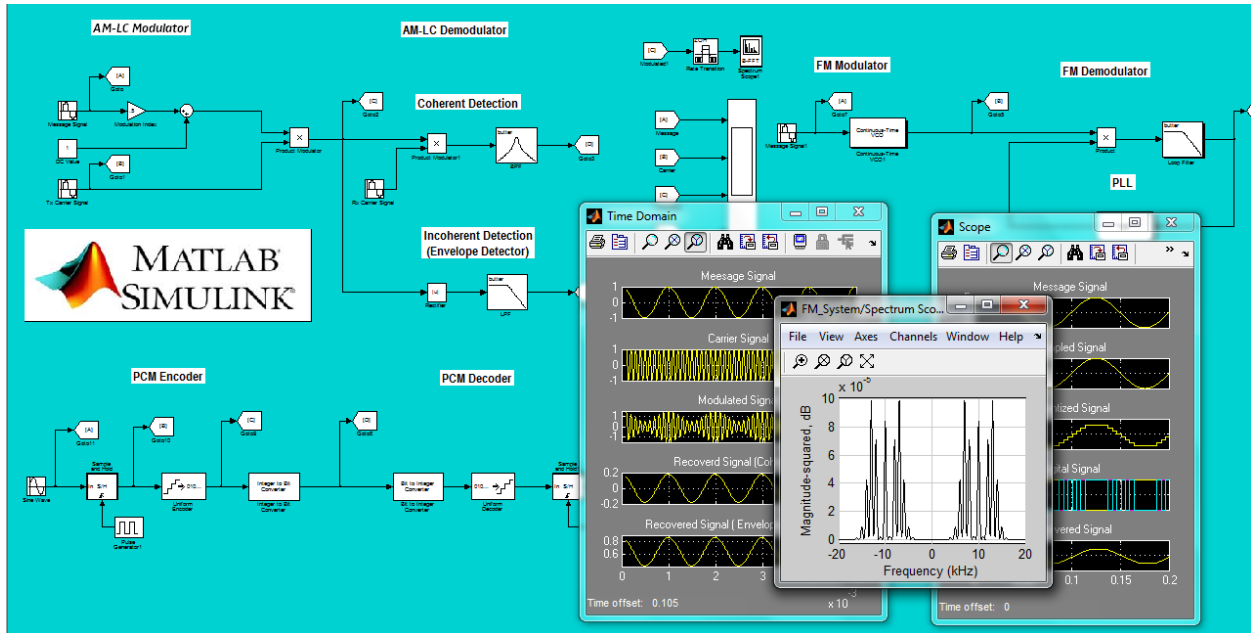


Modeling Communication Systems Using Simulink

DSB-SC Modulation System Model



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Modeling Communication Systems Using Simulink: DSB-SC Modulation System Model

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Chapter 1. Model Version

Version: 1.9

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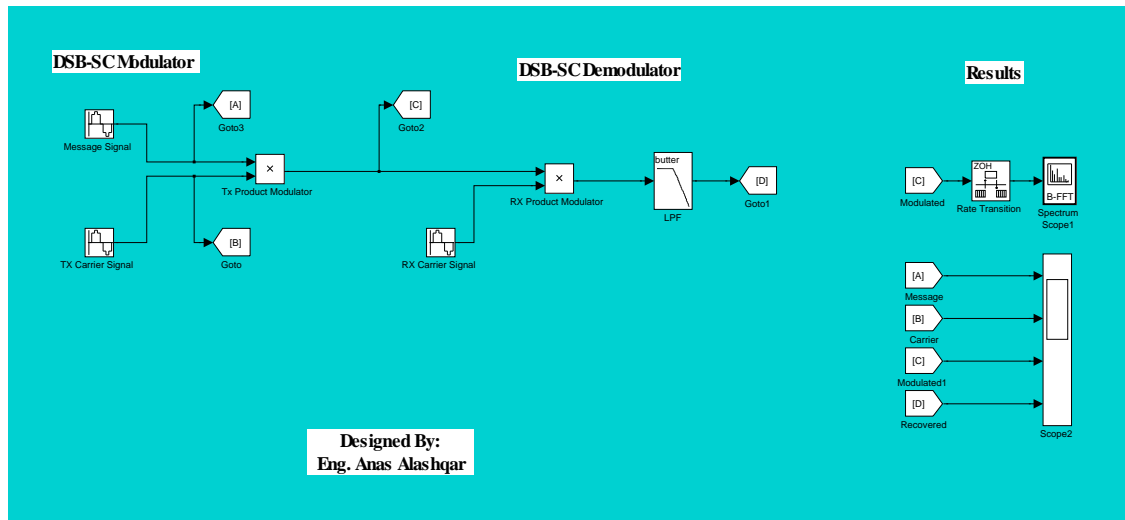
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Chapter 2. DSB-SC Modulation System Model

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Figure 2.1. DSB_System



2.1. Blocks

2.1.1. Parameters

2.1.1.1. "Carrier" (From)

Table 2.1. "Carrier" Parameters

Parameter	Value
Goto tag	B
Icon display	Tag

2.1.1.2. "Goto" (Goto)**Table 2.2. "Goto" Parameters**

Parameter	Value
Tag	B
Icon display	Tag
Tag visibility	local

2.1.1.3. "Goto1" (Goto)**Table 2.3. "Goto1" Parameters**

Parameter	Value
Tag	D
Icon display	Tag
Tag visibility	local

2.1.1.4. "Goto2" (Goto)**Table 2.4. "Goto2" Parameters**

Parameter	Value
Tag	C
Icon display	Tag
Tag visibility	local

2.1.1.5. "Goto3" (Goto)**Table 2.5. "Goto3" Parameters**

Parameter	Value
Tag	A
Icon display	Tag
Tag visibility	local

2.1.1.6. "LPF" (StateSpace)**Table 2.6. "LPF" Parameters**

Parameter	Value
Design method	Butterworth

Parameter	Value
Filter type	Lowpass
Filter order	8
Passband edge frequency (rad/s)	$2\pi \cdot 1000$

2.1.1.7. "Message" (From)

Table 2.7. "Message" Parameters

Parameter	Value
Goto tag	A
Icon display	Tag

2.1.1.8. "Message Signal" (Sin)

Table 2.8. "Message Signal" Parameters

Parameter	Value
Sine type	Time based
Time (t)	Use simulation time
Amplitude	1
Bias	0
Frequency (rad/sec)	$2\pi \cdot 1000$
Phase (rad)	0
Samples per period	1=
Number of offset samples	0
Sample time	1e-6
Interpret vector parameters as 1-D	on

2.1.1.9. "Modulated" (From)

Table 2.9. "Modulated" Parameters

Parameter	Value
Goto tag	C
Icon display	Tag

2.1.1.10. "Modulated1" (From)**Table 2.10. "Modulated1" Parameters**

Parameter	Value
Goto tag	C
Icon display	Tag

2.1.1.11. "Rate Transition" (RateTransition)**Table 2.11. "Rate Transition" Parameters**

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	1/40000

2.1.1.12. "Recovered" (From)**Table 2.12. "Recovered" Parameters**

Parameter	Value
Goto tag	D
Icon display	Tag

2.1.1.13. "RX Carrier Signal" (Sin)**Table 2.13. "RX Carrier Signal" Parameters**

Parameter	Value
Sine type	Time based
Time (t)	Use simulation time
Amplitude	1
Bias	0

Parameter	Value
Frequency (rad/sec)	$2\pi \cdot 10000$
Phase (rad)	0
Samples per period	1=
Number of offset samples	0
Sample time	1e-6
Interpret vector parameters as 1-D	on

2.1.1.14. "RX Product Modulator" (Product)

Table 2.14. "RX Product Modulator" Parameters

Parameter	Value
Number of inputs	2
Multiplication	Element-wise(.*)
Multiply over	All dimensions
Dimension	1
Require all inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Zero
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

2.1.1.15. "TX Carrier Signal" (Sin)

Table 2.15. "TX Carrier Signal" Parameters

Parameter	Value
Sine type	Time based
Time (t)	Use simulation time
Amplitude	1

Parameter	Value
Bias	0
Frequency (rad/sec)	$2\pi \cdot 10000$
Phase (rad)	0
Samples per period	1
Number of offset samples	0
Sample time	1e-6
Interpret vector parameters as 1-D	on

2.1.1.16. "Tx Product Modulator" (Product)

Table 2.16. "Tx Product Modulator" Parameters

Parameter	Value
Number of inputs	2
Multiplication	Element-wise(.*)
Multiply over	All dimensions
Dimension	1
Require all inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Zero
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

2.1.2. Block Execution Order

1. Message Signal [4] (Sin)
2. TX Carrier Signal [6] (Sin)
3. Tx Product Modulator [7] (Product)
4. LPF [3] (StateSpace)
5. Scope2 [6] (Scope)
6. Rate Transition [5] (RateTransition)
7. *Spectrum Scope1*
8. RX Carrier Signal [5] (Sin)

9. RX Product Modulator [6] (Product)
10. Scope1 (SignalViewerScope)