



BLE  
(1 Output Line Extender)

MB  
(2 or 3 Output Mini Bridger)

## ASEM™ Replacement Upgrade RF Modules 1002 MHz For GI/Motorola® BLE & MB

The ACI ASEM 1G replacement upgrade RF modules for the GI/Motorola® BLE and MB are now offered with the Gallium Nitride (GaN) hybrid technology that allows for 3 dB higher output levels while maintaining close to the same specifications as the previous stations with the Gallium Arsenide (GaAs) hybrids. With this increase in the output level capabilities the cable operators are now able to extend the fiber deeper in their networks at a lower cost by reducing the number of active that are needed. The GaN hybrid technology is also extremely beneficial for use in the traditional HFC networks with the increase in station performance at the standard output levels over the GaAS hybrid stations.

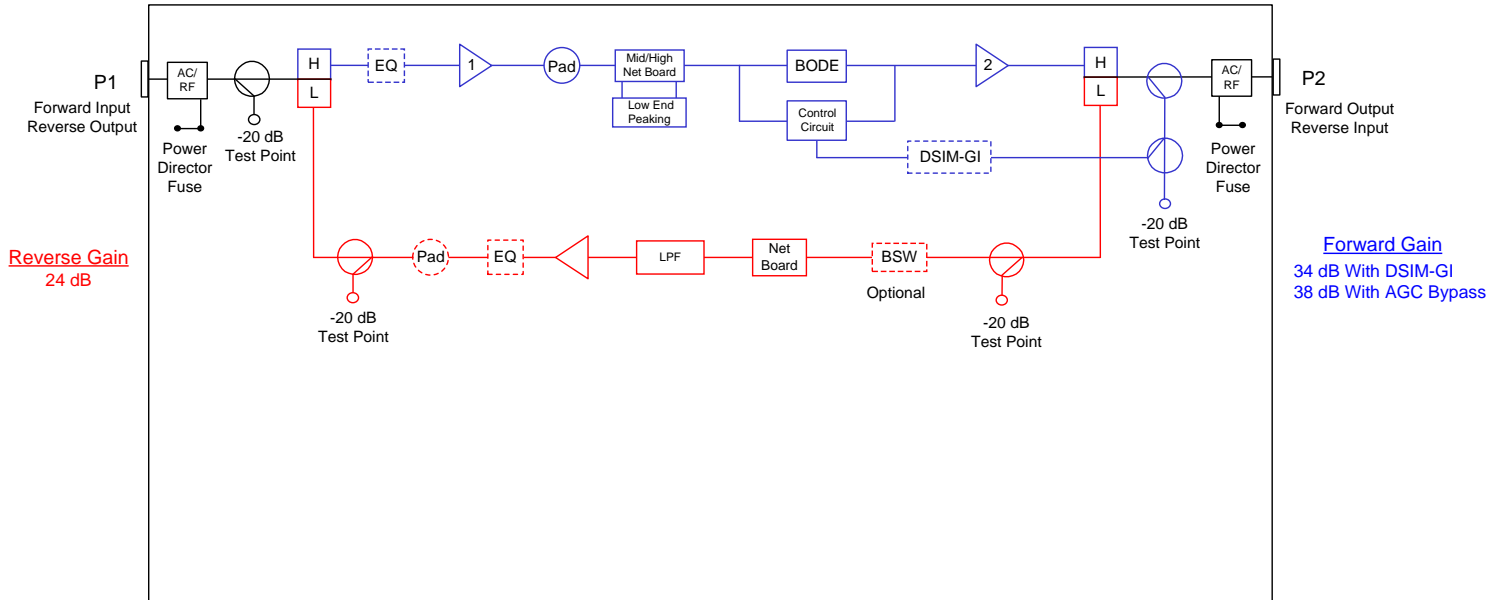
### Features

- ◆ Drop-in 1G replacement RF modules for Motorola® Starline® MB Mini-Bridger and BLE Line Extender
- ◆ 5 to 42, 85 or 204 MHz reverse path
- ◆ Ideal for traditional HFC networks for increased performance & reliability
- ◆ Ideal for fiber deep networks with the extended reach of the amplifiers
- ◆ Patented DSIM technology (Digital AGC)
- ◆ Pad adjustable forward and return EQ's
- ◆ Increased reliability with higher surge protection in the GaN hybrids
- ◆ Up to 3 dB higher output levels with same distortion performance with GaN Hybrids
- ◆ Lower power consumption than OEM amplifiers

# BLOCK DIAGRAMS

## ASEM-BLE

ASEM BLE (Type 3A & 3M) 1002 MHz GaN Amplifier Block Diagram

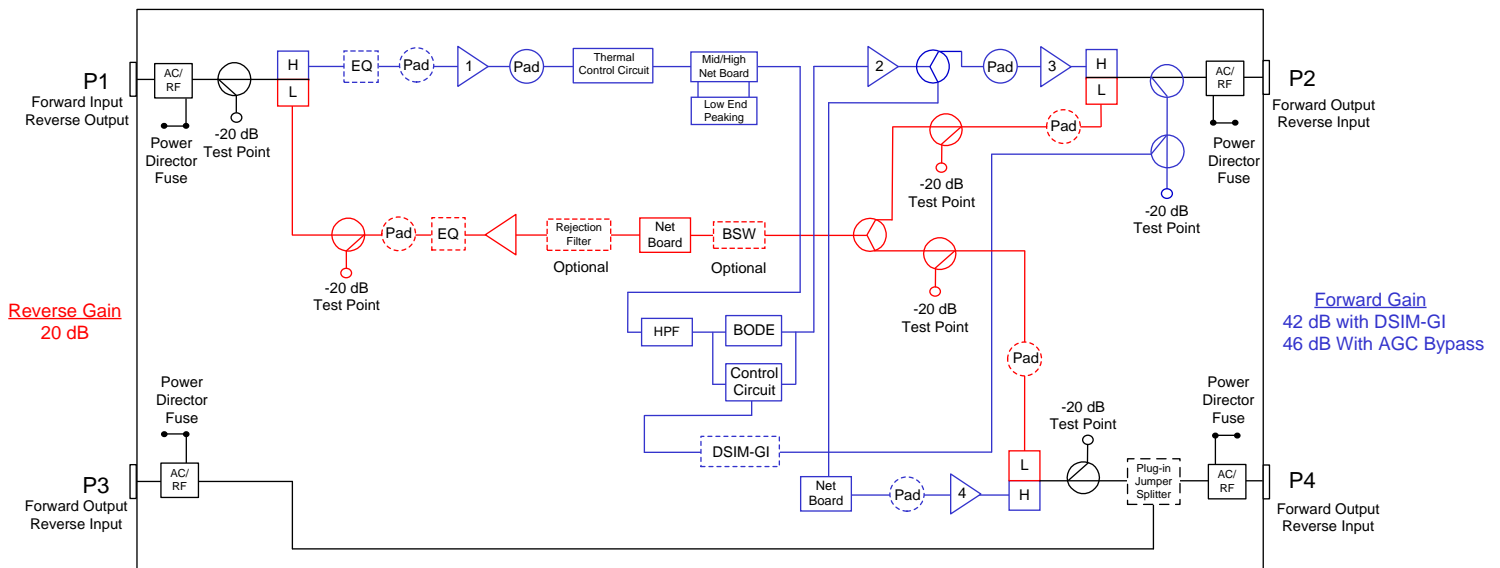


Note:

1. Forward gain stated at 1002 MHz. Reverse gain stated at 42, 85 or 204 MHz.

## ASEM-MB

ASEM MB (Type 2A-TRI & 2M-TRI) 1002 MHz GaN Amplifier Block Diagram



Note:

1. Forward gain stated at 1002 MHz. Reverse gain stated at 42, 85 or 204 MHz.

# SPECIFICATIONS (BLE - Line Extender) – 42/53 MHz Split

STATION PARAMETERS:		1002 MHz 42-53 MHz Split			ASEM - Moto BLE 1002 MHz With GaN Hybrids 9.0 dB Forward Slope @ 1002 MHz High Forward Gain	
SPECIFICATIONS		CONDITIONS	UNITS	Forward	Return	
Housing passband			MHz	53-1002	5-42	
Flatness	Normalized w / 0 dB slope		dB	± 0.5	± 0.5	
Minimum Full Gain			dB	38	NA	
Operation Gain	+1.0 / -0.0 @ 1002MHz		dB	34	24	
Noise Figure	(w / 1dB for input EQ loss)		dB	9	11.0	
Test Point	Forward & Return		dB	20 (±1.0 dB)	20 (±1.0 dB)	
Return Loss	Any port, worst case		dB	16	16	
Hum Modulation	Time domain @ rated 15A		dBc	<60	<60	
Slope Reference Frequency			MHz	54 / 550 / 1002	35 (flat)	
Reference Output Level			dBmV	37 / 44 / 51	-	
Operating Interstage Slope	@ 1002 MHz		dB	9 ± 1	NA	
Distortion Performance (Worse Case)				Forward	Return	
Channel loading				NTSC/550 MHz analog channel loading, 79 channels +450 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier	6 channel analog	
Composite Triple Beat (CTB)			-dBc	75	80	
Composite Second Order (CSO)			-dBc	71	81	
Cross Modulation (XMOD)			-dBc	70	70	
Carrier-to-Intermodulation Noise (CIN)			-dBc	65	-	
Station Group Delay						
55.25 MHz			nSec / 3.58 MHz	40 (35 Typical)		
61.25 MHz				16		
67.25 MHz				10		
77.25 MHz				4		
ADU				DSIM-GI Single Pilot Channel ADU		
Pilot Channel Type			N / A	NTSC Analog or QAM		
Compensation Range			dB	System compensation input change +3/-6 @ 1002 MHz		
Accuracy			±dB	0.5		
Nominal Loss	@ 77 °F (25 °C)		dB	6.25		
Center Frequency Bandwidth				6 (MHz)		
Power Requirements						
DC Voltage			VDC	24		
Current DC Max.	Current draw @ 24 VDC		mA	1000		
Power Consumption Max.			W	35		
AC Input Voltage Range			VAC	38-90		
AC Current Draw Max. @ 90VAC @ 60VAC @ 38VAC			A	0.5 0.6 0.8		
Weight						
Weight			lbs. (kg)	3.31 (1.5)		
Physical						
Dimensions	(H x W x D)		In. (cm)	5.12 X 8.72 X 3.20 (13.0 X 22.14 X 8.20)		
Environmental						
Operating Temperature			°F (°C)	-40 to +140 (-40 to +60)		

# SPECIFICATIONS (MB – Mini-Bridger) 42/53 MHz Split

STATION PARAMETERS: 1002 MHz 42-53 MHz Split			ASEM Moto-MB 1002 MHz With GaN Hybrids 14.0 dB Forward Slope @ 1002 MHz High Forward Gain	
SPECIFICATIONS	CONDITIONS	UNITS	Forward	Return
Housing passband		MHz	53-1002	5-42
Flatness	Normalized w / 0 dB slope	dB	± 0.6	± 0.5
Minimum Full Gain		dB	46	NA
Operation Gain	+1.0 / -0.0 @ 1002MHz	dB	42	20
Noise Figure	(w / 1dB for input EQ loss)	dB	9.1	15.5
Test Point	Forward & Return	dB	20 (±1.0dB)	20 (±1.0dB)
Return Loss	Any port, worst case	dB	15.5	15.5
Hum Modulation	Time domain @ rated 15A	dBc	<60	<65
Slope Reference Frequency		MHz	54 / 550 / 1002	35 (flat)
Reference Output Level		dBmV	37 / 44 / 51	-
Operating Interstage Slope	@ 1002 MHz	dB	14 ± 1	NA
<b>Distortion Performance (Worse Case)</b>			<b>Forward</b>	<b>Return</b>
Channel loading			NTSC/550 MHz analog channel loading, 79 channels +450 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier	6 channel analog
Composite Triple Beat (CTB)		-dBc	75	80
Composite Second Order (CSO)		-dBc	71	81
Cross Modulation (XMOD)		-dBc	68	70
Carrier-to-Intermodulation Noise (CIN)		-dBc	73	-
<b>Station Group Delay</b>				
55.25 MHz		nSec / 3.58 MHz	40 (35 Typical)	
61.25 MHz			16	
67.25 MHz			10	
77.25 MHz			4	
<b>ADU</b>			<b>DSIM-GI Single Pilot Channel ADU</b>	
Pilot Channel Type		N / A	NTSC Analog or QAM	
Compensation Range		dB	System compensation input change +3/-6 @ 1002 MHz	
Accuracy		±dB	0.5	
Nominal Loss	@ 77 °F (25 °C)	dB	6.25	
Center Frequency Bandwidth			6 (MHz)	
<b>Power Requirements</b>				
DC Voltage		VDC	24	
Current DC Max.	Current draw @ 24 VDC	mA	1590	
Power Consumption Max.		W	52	
AC Input Voltage Range		VAC	38-90	
AC Current Draw Max.		A		
@ 90VAC			0.58	
@ 60VAC			0.92	
@ 38VAC			1.45	
<b>Weight</b>				
Weight		lbs. (kg)	3.75 (1.7)	
<b>Physical</b>				
Dimensions	(H x W x D)	In. (cm)	5.9 X 12.6 X 2.36 (15 X 32 X 6)	
<b>Environmental</b>				
Operating Temperature		°F (°C)	-40 to +140 (-40 to +60)	

# SPECIFICATIONS (BLE - Line Extender) – 85/105 MHz Split

STATION PARAMETERS: 1002 MHz 85-105 MHz Split			ASEM - Moto BLE 1002 MHz With GaN Hybrids 8.0 dB Forward Slope @ 1002 MHz High Forward Gain	
SPECIFICATIONS	CONDITIONS	UNITS	Forward	Return
Housing passband		MHz	105-1002	5-85
Flatness	Normalized w / 0 dB slope	dB	± 0.5	± 0.5
Minimum Full Gain		dB	38	NA
Operation Gain	+1.0 / -0.0 @ 1002MHz	dB	34	24
Noise Figure	(w / 1dB for input EQ loss)	dB	9	11.0
Test Point	Forward & Return	dB	20 (±1.0 dB)	20 (±1.0 dB)
Return Loss	Any port, worst case	dB	16	16
Hum Modulation	Time domain @ rated 15A	dBc	<60	<60
Slope Reference Frequency		MHz	109 / 550 / 1002	35 (flat)
Reference Output Level		dBmV	38 / 44.4 / 51	-
Operating Interstage Slope	@ 1002 MHz	dB	8 ± 1	NA
Distortion Performance (Worse Case)			Forward	Return
Channel loading			NTSC/550 MHz analog channel loading, 71 channels +450 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier	12 channel analog
Composite Triple Beat (CTB)		-dBc	75	80
Composite Second Order (CSO)		-dBc	71	81
Cross Modulation (XMOD)		-dBc	70	70
Carrier-to-Intermodulation Noise (CIN)		-dBc	65	-
Station Group Delay				
109.25 MHz		nSec / 3.58 MHz	25	
115.25 MHz			16	
121.25 MHz			10	
127.25 MHz			3	
ADU			DSIM-GI Single Pilot Channel ADU	
Pilot Channel Type		N / A	NTSC Analog or QAM	
Compensation Range		dB	System compensation input change +3/-6 @ 1002 MHz	
Accuracy		±dB	0.5	
Nominal Loss	@ 77 °F (25 °C)	dB	6.25	
Center Frequency Bandwidth			6 (MHz)	
Power Requirements				
DC Voltage		VDC	24	
Current DC Max.	Current draw @ 24 VDC	mA	1000	
Power Consumption Max.		W	35	
AC Input Voltage Range		VAC	38-90	
AC Current Draw Max. @ 90VAC @ 60VAC @ 38VAC		A	0.5 0.6 0.8	
Weight				
Weight		lbs. (kg)	3.31 (1.5)	
Physical				
Dimensions	(H x W x D)	In. (cm)	5.12 X 8.72 X 3.20 (13.0 X 22.14 X 8.20)	
Environmental				
Operating Temperature		°F (°C)	-40 to +140 (-40 to +60)	

# SPECIFICATIONS (MB – Mini-Bridger) 85/105 MHz Split

STATION PARAMETERS:		1002 MHz 85-105 MHz Split		ASEM Moto-MB 1002 MHz With GaN Hybrids 13.0 dB Forward Slope @ 1002 MHz High Forward Gain	
SPECIFICATIONS		CONDITIONS	UNITS	Forward	Return
Housing passband			MHz	105-1002	5-85
Flatness	Normalized w / 0 dB slope		dB	± 0.6	± 0.5
Minimum Full Gain			dB	46	NA
Operation Gain	+1.0 / -0.0 @ 1002MHz		dB	42	20
Noise Figure	(w / 1dB for input EQ loss)		dB	9.1	15.5
Test Point	Forward & Return		dB	20 (±1.0dB)	20 (±1.0dB)
Return Loss	Any port, worst case		dB	15.5	15.5
Hum Modulation	Time domain @ rated 15A		dBc	<60	<65
Slope Reference Frequency			MHz	109 / 550 / 1002	35 (flat)
Reference Output Level			dBmV	38 / 44.4 / 51	-
Operating Interstage Slope	@ 1002 MHz		dB	13 ± 1	NA
<b>Distortion Performance (Worse Case)</b>				<b>Forward</b>	<b>Return</b>
Channel loading				NTSC/550 MHz analog channel loading, 71 channels +450 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier	12 channel analog
Composite Triple Beat (CTB)			-dBc	75	80
Composite Second Order (CSO)			-dBc	71	81
Cross Modulation (XMOD)			-dBc	68	70
Carrier-to-Intermodulation Noise (CIN)			-dBc	73	-
<b>Station Group Delay</b>					
109.25 MHz			nSec / 3.58 MHz	25	
115.25 MHz				16	
121.25 MHz				10	
127.25 MHz				3	
<b>ADU</b>				<b>DSIM-GI Single Pilot Channel ADU</b>	
Pilot Channel Type			N / A	NTSC Analog or QAM	
Compensation Range			dB	System compensation input change +3/-6 @ 1002 MHz	
Accuracy			±dB	0.5	
Nominal Loss	@ 77 °F (25 °C)		dB	6.25	
Center Frequency Bandwidth				6 (MHz)	
<b>Power Requirements</b>					
DC Voltage			VDC	24	
Current DC Max.	Current draw @ 24 VDC		mA	1590	
Power Consumption Max.			W	52	
AC Input Voltage Range			VAC	38-90	
AC Current Draw Max. @ 90VAC @ 60VAC @ 38VAC			A	0.58 0.92 1.45	
<b>Weight</b>					
Weight			lbs. (kg)	3.75 (1.7)	
<b>Physical</b>					
Dimensions	(H x W x D)		In, (cm)	5.9 X 12.6 X 2.36 (15 X 32 X 6)	
<b>Environmental</b>					
Operating Temperature			°F (°C)	-40 to +140 (-40 to +60)	

# SPECIFICATIONS (BLE - Line Extender) – 204/258 MHz Split

STATION PARAMETERS:			1002 MHz 204-258 MHz Split		ASEM - Moto BLE 1002 MHz With GaN Hybrids 5.5 dB Forward Slope @ 1002 MHz High Forward Gain	
SPECIFICATIONS		CONDITIONS	UNITS	Forward	Return	
Housing passband			MHz	258-1002	5-204	
Flatness		Normalized w / 0 dB slope	dB	± 0.5	± 0.5	
Minimum Full Gain			dB	38	NA	
Operation Gain		+1.0 / -0.0 @ 1002MHz	dB	34	24	
Noise Figure		(w / 1dB for input EQ loss)	dB	9	11.0	
Test Point		Forward & Return	dB	20 (±1.0 dB)	20 (±1.0 dB)	
Return Loss		Any port, worst case	dB	16	16	
Hum Modulation		Time domain @ rated 15A	dBc	<60	<60	
Slope Reference Frequency			MHz	258 / 550 / 1002	35 (flat)	
Reference Output Level			dBmV	40.5 / 44.6 / 51	-	
Operating Interstage Slope		@ 1002 MHz	dB	5.5 ± 1	NA	
<b>Distortion Performance (Worse Case)</b>				<b>Forward</b>	<b>Return</b>	
Channel loading				292 MHz analog channel loading, 58 channels + 660 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier	31 channel analog	
Composite Triple Beat (CTB)			-dBc	75	90	
Composite Second Order (CSO)			-dBc	71	82	
Cross Modulation (XMOD)			-dBc	70	80	
Carrier-to-Intermodulation Noise (CIN)			-dBc	65	-	
<b>Station Group Delay</b>						
Group delay		Channel 30	nSec / 3.58 MHz		30	
Group delay		Channel 31			16	
Group delay		Channel 32			10	
Group delay		Channel 33 & up			3	
<b>ADU</b>					<b>DSIM-GI Single Pilot Channel ADU</b>	
Pilot Channel Type			N / A		NTSC Analog or QAM	
Compensation Range			dB		System compensation input change +3/-6 @ 1002 MHz	
Accuracy			±dB		0.5	
Nominal Loss		@ 77 °F (25 °C)	dB		6.25	
Center Frequency Bandwidth					6 (MHz)	
<b>Power Requirements</b>						
DC Voltage			VDC		24	
Current DC Max.		Current draw @ 24 VDC	mA		1000	
Power Consumption Max.			W		35	
AC Input Voltage Range			VAC		38-90	
AC Current Draw Max. @ 90VAC @ 60VAC @ 38VAC			A		0.5 0.6 0.8	
<b>Weight</b>						
Weight			lbs. (kg)		3.31 (1.5)	
<b>Physical</b>						
Dimensions		(H x W x D)	In, (cm)		5.12 X 8.72 X 3.20 (13.0 X 22.14 X 8.20)	
<b>Environmental</b>						
Operating Temperature			°F (°C)		-40 to +140 (-40 to +60)	

# SPECIFICATIONS (MB – Mini-Bridger) 204/258 MHz Split

STATION PARAMETERS: 1002 MHz 204-258 MHz Split			ASEM Moto-MB 1002 MHz With GaN Hybrids 10.5 dB Forward Slope @ 1002 MHz High Forward Gain	
SPECIFICATIONS	CONDITIONS	UNITS	Forward	Return
Housing passband		MHz	258-1002	5-204
Flatness	Normalized w / 0 dB slope	dB	± 0.6	± 0.5
Minimum Full Gain		dB	46	NA
Operation Gain	+1.0 / -0.0 @ 1002MHz	dB	42	20
Noise Figure	(w / 1dB for input EQ loss)	dB	9.1	15.5
Test Point	Forward & Return	dB	20 (±1.0dB)	20 (±1.0dB)
Return Loss	Any port, worst case	dB	14.5	14.5
Hum Modulation	Time domain @ rated 15A	dBc	<-60	<-65
Slope Reference Frequency		MHz	258 / 550 / 1002	35 (flat)
Reference Output Level		dBmV	40.5 / 44.6 / 51	-
Operating Interstage Slope	@ 1002 MHz	dB	10.5 ± 1	NA
Distortion Performance (Worse Case)			Forward	Return
Channel loading			292 MHz analog channel loading, 58 channels + 660 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier	31 channel analog
Composite Triple Beat (CTB)		-dBc	75	90
Composite Second Order (CSO)		-dBc	71	82
Cross Modulation (XMOD)		-dBc	68	80
Carrier-to-Intermodulation Noise (CIN)		-dBc	73	-
Station Group Delay				
109.25 MHz		nSec / 3.58 MHz		25
115.25 MHz				16
121.25 MHz				10
127.25 MHz				3
ADU			DSIM-GI Single Pilot Channel ADU	
Pilot Channel Type		N / A	NTSC Analog or QAM	
Compensation Range		dB	System compensation input change +3/-6 @ 1002 MHz	
Accuracy		±dB	0.5	
Nominal Loss	@ 77 °F (25 °C)	dB	6.25	
Center Frequency Bandwidth			6 (MHz)	
Power Requirements				
DC Voltage		VDC	24	
Current DC Max.	Current draw @ 24 VDC	mA	1590	
Power Consumption Max.		W	52	
AC Input Voltage Range		VAC	38-90	
AC Current Draw Max.		A		
@ 90VAC			0.58	
@ 60VAC			0.92	
@ 38VAC			1.45	
Weight				
Weight		lbs. (kg)	3.75 (1.7)	
Physical				
Dimensions	(H x W x D)	In. (cm)	5.9 X 12.6 X 2.36 (15 X 32 X 6)	
Environmental				
Operating Temperature		°F (°C)	-40 to +140 (-40 to +60)	



## Accessory Ordering Information:

The ASEM Moto ordering matrix provides the part number information to order the configured stations. This page contains the ordering information for the required accessories that will be needed to make the stations functional in the field or the optional accessories that can be ordered separately.

### Required Accessories

Description	Part Numbers (Where XX.X = dB value)
JXP style attenuator pads <ul style="list-style-type: none"> <li>• 1 Required for forward input</li> <li>• 1 Required for reverse output</li> <li>• 1 Required for forward input Equalizer</li> <li>• 1 Required for reverse output Equalizer</li> </ul>	JXP137B-XX (0 to 20 dB in 1.0 dB steps)

### Optional Accessories

Description	Part Numbers
Digital Station Intelligence Manager - Single Pilot AGC Module (Analog or Digital)	DSIM-GI-MDL-02
Digital Station Intelligence Manager -Controller	DSCT-xxx-yyy xxx = Pilot Channel Number yyy = Channel Type IRC = Analog IRC Spacing DIG = Digital / QAM
DSIM Bluetooth Dongle Apple iOS or android	DSIM-DONGLE-02
Cable assembly DSIM adaptor to connect controller	240330-01
Pad Adjustable Equalizer JXP Platform 0-18 dB	AEQDA1G
Pad Adjustable Cable Equivalent Equalizers JXP Platform 0-9 dB	ACEQ1G
Pad Adjustable Reverse Equalizers 5-42, 85 and 204 MHz JXP Platform 0-12 dB (5 Pin)	AREQ42 AREQ85 AREQ204
Reverse Rejection Filter 14 MHz	RPRFLTR-14
Reverse Rejection Filter 8 MHz	RPRFLTR-8
Reverse Rejection Filter by-pass	RPRFLTR-JMP
Motorola MB DC/SP2 For P3 or P4	088131-01 (Jumper One include with Unit) SDASPLTR3.5 SDADC7 SDADC10 SDADC12
Test Probe (5.5" Long)	100685-01
Test Probe (1.57" / 4 cm Long)	TP-7504
Seizure 15 Amp RED 10 Amp Housing for Motorola MB (QTY 4)	120577-04
Seizure 15 Amp RED 15 Amp Housing for Motorola MB (QTY 4)	120578-04
Seizure 15 Amp RED 15 Amp Housing Motorola BLE (QTY 2)	120596-02
Conversion Kit, 85/105 ASEM MOTO BLE	120579-01
Conversion Kit, 85/105 ASEM MOTO MB	120580-01

# Ordering Matrix™

## ASEM Moto Product Configuration Worksheet

Customer: \_\_\_\_\_

Created By: \_\_\_\_\_ Order Date: \_\_\_\_\_

### ORDERING MATRIX

September 23, 2020

Position	1	2	3	4	5	6	7	8	9	10
PART NUMBER										

1,2  STATION TYPE

BL = 1 Output LE      MB = 2 or 3 Output Bridger

3  BANDPASS SPLIT

K = 5-42 MHz / 54- 1002 MHz  
N = 5-85 MHz / 105- 1002 MHz

H = 5-204 MHz / 258-1002 MHz

4,5  STATION GAIN (Forward)

Amplifier Model	BL	MB
Max gain with DSIM-GI	34	42
Max gain w/AGC bypass	38	46

6  FORWARD GAIN CONTROL TYPE

M = Manual (AGC Bypass)      D = Digital Station Intelligence Manger (DSIM-GI)

7  STATION SLOPE

	42/54		85/105		204/258	
A =	MB	BL	MB	BL	MB	BL
	14.0	9.0	13.0	8.0	10.5	5.5

8  STATION GAIN (Reverse)

B = 20 dB min (MB Only)  
L = 24 dB min (BL Only)

9  HOUSING OPTIONS

M = RF Module Only

10  CUSTOM OPTIONS

0 = NONE  
X = Determined by Product Management

Generic Order Form: Not all configurations are available



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