



Photline MBC are a family of automatic bias controllers specially designed to lock the operating point of  $\text{LiNbO}_3$  Mach-Zehnder modulators near the quadrature point and ensure a stable operation over time and environmental conditions.

Unlike classical dither signal based bias controllers, Photline MBC-AN do not superimpose any tone signal to the optical modulated signal. They are designed for application where such a tone signal is not desired and typically for analog applications where a high purity carrier is required. They are easy to implement, and are available as benchtop instruments and OEM boards.

## FEATURES

- Designed for Mach-Zehnder modulators
- Quad modes
- High stability

## APPLICATIONS

- RoF links
- Electronic warfare
- Analog communications

## OPTIONS

- Internal photodiodes and tap couplers
- Benchtop and board versions

## RELATED EQUIPMENTS

- MXAN-LN, MXDO-LN analog modulators
- DR-AN series analog RF amplifiers

## Principle

Photline MBC-AN bias controllers are based on the comparison of the optical power before and after the Mach-Zehnder modulator. They use tap couplers and photodiodes with a proportionnal integrator feed back loop to lock the operating point of the modulator at the Quad+ or Quad- position.

The Photline MBC-AN-board and the Photline MBC-AN-BT are operated from a user supplied PC and come with a Graphical User Interface.

## Performance Highlights

Parameter	Min	Typ	Max	Unit
Mode	Ditherless			-
DC bias voltage	-12	-	+12	V
Locking point	Quad- or Quad+			-
Output power stability	-	$\pm 0.1$	-	dB
Insertion loss (C-band)	-	-	2	dB
Control	Remote			-

## Bias Control and Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Locking point	-	Automatic	Quad+ or Quad-			-
Output power stability	-	at quadrature operating points	-	±0.1	-	dB
Modulator bias voltage	$V_{\text{bias}}$	automatic mode	-12	-	+12	V
		manual mode	-11.5	-	+11.5	V

## Optical Characteristics

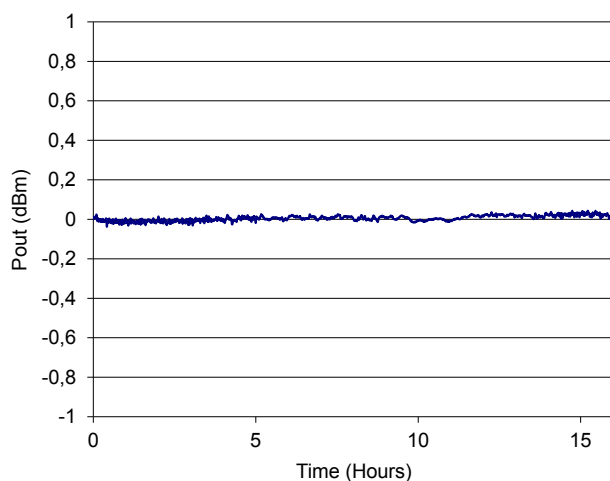
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Wavelength	$\lambda$	-	1 530	-	1 580	nm
Input optical power	$P_{\text{IN}}$	with internal PD and tap coupler	0	-	18	dBm
Insertion loss	IL	with internal PD and tap couplers - C-Band	-	-	2	dB

## Absolute Maximum Ratings

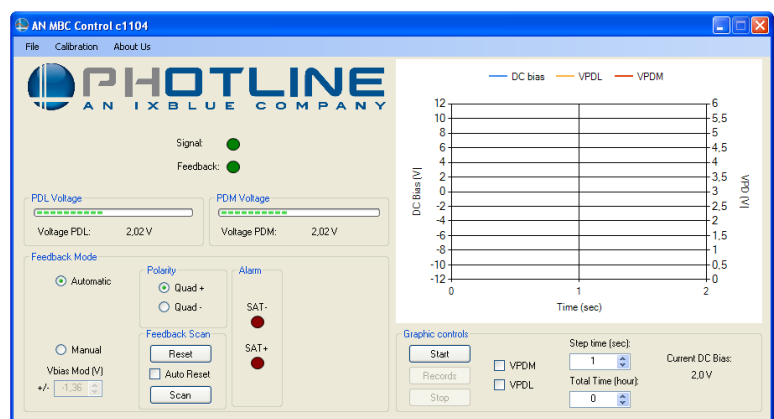
Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Operating temperature	OT	-10	+45	°C
Storage temperature	ST	-40	+75	°C

## Output Power Stability



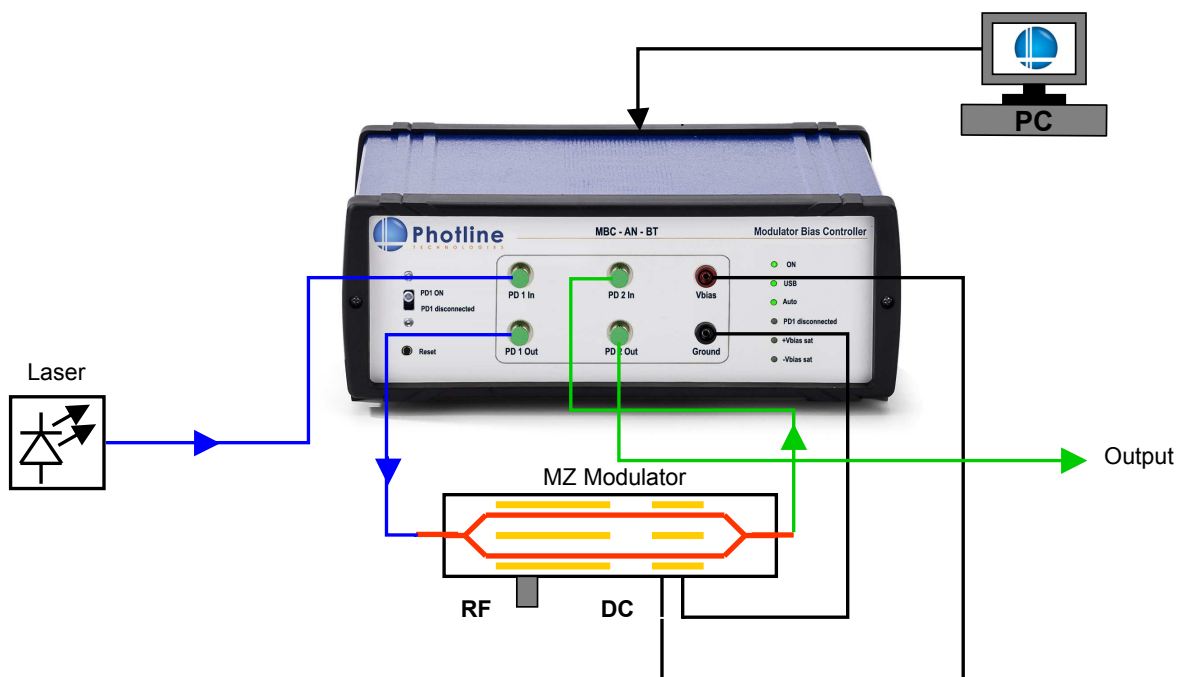
## Graphical User Interface



## MBC-AN-BT

Benchtop version

The MBC-AN-BT is a benchtop instrument that incorporates input and output tap couplers with their photodiode together with the bias control electronic.



Dimensions	
Dimensions (W x H x D)	24 cm x 8.5 cm x 16 cm
Weight	1.5 kg - 3.3 pounds
Power supply (rear panel)	100-120 V / 220-240 V automatic switch, 50-60 Hz
Interfaces	
Bias voltage output	2 mm jack (cables supplied)
Ground	2 mm jack (cables supplied)
Optical inputs and outputs	FC/APC bulkhead (other on request)
Remote Control	
Type	GUI
Connector	USB type B

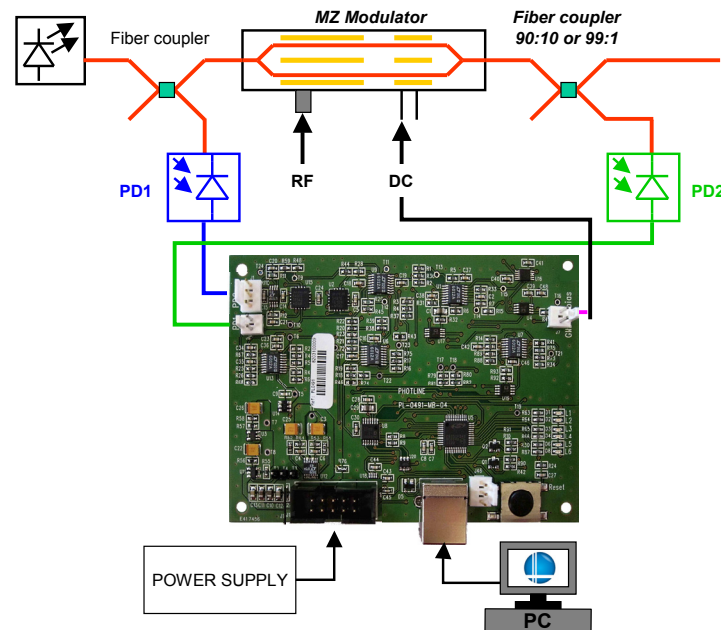
## Ordering information

Benchtop Modulator Bias Controller MBC-AN-BT

## MBC-AN-board

OEM version

The MBC-AN-BT is an OEM bias control electronic board designed for integration, it comes with optional input and output tap couplers with their photodiode.



Dimensions	
Dimensions (W x H x D)	100 mm x 70 mm x 27 mm
Supply voltages	-12 V (max -15V) / 0 / +12 V (max +15 V)
Supply current	-50 mA / 0 / +60 mA
Interfaces	
Photodiodes input, Vbias, Ground	2.4 mm plug-in connector
Remote Control	
Type / Connector	GUI / USB type B

### Ordering information

Board Modulator Bias Controller MBC-AN-Board  
 Photodiode and tap coupler set, 1300-1550 nm region OPT-PD/TAP-1550

### About us

iXBlue Photonics includes iXBlue iXfiber brand that produces specialty optical fibers and Bragg gratings based fiber optics components and iXBlue Photline brand that provides optical modulation solutions based on the company lithium niobate (LiNbO<sub>3</sub>) modulators and RF electronic modules.

iXBlue Photonics serves a wide range of industries: sensing and instruments, defense, telecommunications, space and fiber lasers as well as research laboratories all over the world.

3, rue Sophie Germain  
 25 000 Besançon - FRANCE  
 Tel. : +33 (0) 381 853 180 - Fax : + 33 (0) 381 811 557

iXblue reserves the right to change, at any time and without notice, the specifications, design, function or form of its products described herein. All statements, specification, technical information related to the products herein are given in good faith and based upon information believed to be reliable and accurate at the moment of printing. However the accuracy and completeness thereof is not guaranteed. No liability is assumed for any inaccuracies and as a result of use of the products. The user must validate all parameters for each application before use and he assumes all risks in connection with the use of the products