## MBC DG GUI

## MBC INTERFACE

## User Manual

Version 2.6



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### **Interface - Introduction**

Photline proposes a graphical user interface to simplify bias control management for the ModBox and MBC products family. Based on a RS232 serial communication and a Visual Basic<sup>®</sup> interface, bias parameters are strictly similar also whole bias control are tunable and could be saved and loaded.

### **Interface - Setup**

#### **Minimum Computer Requirements**

- Processor 1 GHz with 512MB RAM
- Disk space (minimum) 32-bit : 600 MB 64-bit: 1.5 GB
- Windows XP Professional SP3
- One USB port for each MBC to drive.

#### Software installation

1/ Log on with an administrator account.

- 2/ Insert the Photline CD-ROM into the CD drive or plug the USB key.
- 3/ Install setup.exe (system restart maybe required)
- 4/ Install USB MBC Drivers (if needed)
- 5/ Run MBC DG Control.exe file

#### Hardware Setup

- 1. Connect USB cable to the controller rear panel and the PC
- 2. Plug the power cable and switch on the device.
- 3. USB MBC connexion will be seen as COM peripheral by your PC





### **Interface - Operation**

#### **General considerations**

One needs to choose the COM port. To proceed, click on the down arrow of the list box and select the COM port connected to the controller.

DG MBC Control	
File Advanced Diagnostic About	t Us
COM1 COM2 COM24 COM23 COM25 COM25 COM26 Settings Monitoring	
Running Mode	Auto Calibration Global settings:
AUTO Scan Restart	QUAD Save Config
DC BIAS :	Load Config
MAN DC Bias voltage (V) 1,000 ♀ Step (V): 0,1 ♥	MIN Config: 1 -
Optical power 100% 50%	QUAD x V x Driving voltage

After selecting your port, click on "Connect" to obtain your S/N number and activate the rest of the interface.



DG MBC Control		X-
File Advanced Diagnostic About	Us	
Disconnect		LINE
SCP1540	NIXBL	UE BRAND
Settings Monitoring		
Running Mode	Auto Calibration	Global settings:
AUTO     Scan Restart	QUAD	Save Config
DC BIAS :		Load Config
MAN DC Bias voltage (V) 0,000	MIN	Config: 1
Step (V): 0,1 -	MAX	Refresh Screen
Optical power 100% 50% - 0%		Driving voltage

Once done, the MBC serial number will be displayed.





#### Setting bias control parameters

• Standard Mode:

DG MBC Control	
File Advanced Diagnostic About	rt Us
Disconnect	
Settings Monitoring	
Running Mode	Auto Calibration Global settings:
AUTO     Scan Restart	QUAD Save Config
DC BIAS :	Load Confin
MAN           DC Bias voltage (V)           0,000           ▼           Step (V):	MIN Config: 1 -
Optical power 100% 50%	QUAD v x V x Voltage

Figure 1: Bias control standard parameters

*Auto-Calibration* button: A scan of the system is performed in order to find the right MBC parameters for the 3 most used setting points: QUAD, MIN, MAX. (see Annexe for details) *Scan Restart* button: The bias control routine is reinitialised. This is recommended to restart the feedback control when some parameters have been changed (Dither amplitude, Dither frequency, Photodiode gain).

*Refresh Screen* button: Application reloads all parameters from the board.

*Save Config* button: Current configuration is saved in one of the 3 configuration area. (Config 1-3).

Load Config button: Selected configuration is loaded into MBC (Config 1-3).





• Advanced Mode:

COM24	רסווי	LINE
SCP1540	NIXBL	UE BRAND
Settings Monitoring Expert Settings		
Running Mode	Auto Calibration	Global settings:
AUTO     Scan Restart	QUAD	Save Config
		Load Config
MAN     DC Bias voltage (V)     0 000	MIN	Config: 1
Step (V): 0,1 ▼	MAX	Refresh Screen
Photodiode settings:	Dither settings:	
Signal	Frequency (Hz)	
Inverted	1000 🚖	
Not Inv.	Send	Transfert Level (%)
Gain	Amplitude (mV)	0,0
50	100	Send
Send	Send	

Figure 2: Bias control advanced parameters

Running Mode	: Auto / Manual
DC Bias Voltage	: From –10 to +10V (variable step)
Transfer Level	: From –100% to +100% (0.1% step)
Dither Frequency	: From 400 to 1400Hz (40Hz step)
Dither Amplitude	: From 10 to 1000mV (typically 10mV step)
Photodiode Polarity	: Inverted or Non Inverted (Non Inv.)
Photodiode Gain	: From 1 (Low) to 127 (High)

After setting a value, it has to be validated with "Send" button. The validation is effective only when "Send" button restore its initial colour.



Saving and loading bias control parameters



Figure 3 : bias control parameters save and load buttons

*Save* : All bias control parameters are saved in a file for further loading. The user specifies the file name and its path through a dialog box.

*Load button* : All bias control parameters are loaded from a file specified by the user in a dialog box.





### **Bias monitoring**

DG MBC Control	
File Standard Diagnostic About Us	
COM24 Disconnect SCP1540 Settings Monitoring	D
DC BIAS	
10	
4	
v2 2	
-6	
-8	
Time (sec)	
Graphic controls Becords settings:	
Step time (sec): 1 Current DC Bias:	
Total Time (hour): 0 🗢 0 V	
Records	

Figure 4: bias monitoring control

DC bias is always monitored, you can clear or save the graph.





The *Records* function allows saving a measure with a specific step time. It saves in a text file, time and DC bias value.

DG MBC Control
File Standard Diagnostic About Us
COM24 Disconnect SCP1540 Settings Monitoring
DC BIAS
10
4
v2 2
-6
-8
Time (sec)
Graphic controls
Records settings: Step time (sec): 1 Current DC Bias:
Save Graph Total Time (hour): 0   0 V
Clear Graph Records

Figure 5 : start recording bias values

The "*Record*" button starts the bias recording procedure.

First step:

Set the time interval between each record with "Step Time" and the record duration with "Total Time" in hour. "Total time" at 0 means recording until "Stop" button is pressed. Second step:

Press "Records" button and a dialog box appear to set the file name and destination folder. <u>Third step:</u>

Press "Save" button in the dialog box to launch record procedure.



DG MBC Control
File Advanced Diagnostic About Us
COM24       Disconnect       SCP1540       Settings
DC BIAS
SYBDO SY
Graphic controls     Records settings:       Save Graph     Step time (sec):       Clear Graph     1       Stop     0 V

Figure 6 : stop recording bias values

At any time it is possible to stop the record procedure by clicking on the "Stop" button (See Figure 6).





Manual mode

DG MBC Control		X
File Standard Diagnostic Abo	ut Us	
COM24 Disconnect SCP1540 Settings Monitoring		
Running Mode	Auto Calibration	Global settings:
AUTO     Scan Restart	QUAD	Save Config
MAN   DC Bias voltage (V)   0,000	MIN	Load Config Config: 1 Refresh Screen
Photodiode settings: Signal Inverted Not Inv. Gain Send	Dither settings: Frequency (Hz) Send Amplitude (mV) 0 Send Send	Transfert Level (%) 0,0

figure 7 :bias control in manual mode

In Manual Mode, the Bias control works as a DC voltage source. The applied bias is adjusted by decreasing / increasing the "*DC Bias Voltage*" (See Figure 7). It is also possible to change the step.





### **Diagnostic:**

Diagnostic is a function which is used by our support team. It will help us understand and see what can be your feedback loop problem. Click on *Diagnostic* and enter the Password: "trepxe".

DG MBC Control	
File Advanced Diagnostic About	Us
COM24 Disconnect SCP1540	
Bunning Mode	Auto Calibration Global settings:
AUTO Scan Restart	QUAD Save Config
DC BIAS :	
MAN DC Bias voltage 0,000 Step (V): 0,1	Config: 1   Refresh Screen
Optical power 100% 50% -	QUAD x WAX Driving voltage

figure 8 :bias control in manual mode





You obtain a new tab:

DG MBC Control
File Advanced About Us
Disconnect SCP1540
Warning : Don't forget to light on your laser.
Start Diagnostic

figure 9 :bias control in manual mode

Click on tab diagnostic and send an email to us with the diagnostic file.





Auto calibration step:

Step	Quad	Min / Max
1	Apply a dither of 120mV	Apply a dither of 120mV
2	Do a scan to detect DC $V\pi$	Do a scan to detect DC V $\pi$
3	Dither is set to 3% of $V\pi$	Dither is set to 3% of V $\pi$
4	Set modulator to Quad point	Set modulator to Quad point
5	Increase Photodiode Gain until	Increase Photodiode Gain until
	obtaining a value of 2Vpp on our ADC.	obtaining a value of 2Vpp on our ADC
	Photodiode Gain is limited to 120	Photodiode Gain is limited to 120
6	Do a Scan	Set the dither to 0.25% of V $\pi$
7	Board is locked to Quad Point	Do a Scan
8		Board is locked to Min or Max Point

If the feedback loops oscillate, you can reduce the Photodiode Gain in order to stabilize the loop (reducing from 5 to 20 is generally enough).

