

**Evaluation Board** 

# **General Description**

This evaluation board allows for testing the MIC3003 and checking the proper function of all the features implemented in the controller. There are two versions of the board, one with the soldered device onboard and the second with a mounted socket, which allows for the evaluation and programming of the part without soldering it to the board.

The only differences between the two boards are the socket and a few components that are mounted on the backside of the board.

The board features additional circuitry to provide loads to the outputs from the device and current or current feedback to emulate the behavior of a common cathode or common anode TOSA and ROSA of a FOM.

The board can be self-powered from a computer through the USB interface and an on-board 5V to 3.3V converter.

Datasheets and support documentation can be found on Micrel's web site at: <u>www.micrel.com</u>.

# Features

- Loads and feedback circuits to emulate common anode and common cathode TOSA
- Open loop or close loop operation
- Self powered via USB interface

# **Related Support Documentation**

- MIC3003 Datasheet
- MIC3003 Software Installation Guide
- MIC3003 Evaluation Software

# **Evaluation Board**



**Board with Device Soldered** 



**Board with Socket** 

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# Evaluation Board Setting and Operation

### Serial Interface and Power

The communication between the computer and the MIC3003 can be done in two ways:

- Through the parallel port of the computer by connecting the CLK and DATA to TP17 and TP18 respectively and opening positions 1 and 2 of SW11. If this option is chosen, the board must be powered with an external 3.3V source and a jumper installed between pin 2 and pin 3 of SW10.
- 2. Through the USB port of the computer that connects to the on-board USB type B receptacle. If this option is chosen, the board can be powered by an external 3.3V or can be powered using the 5V voltage from the USB interface. The USB 5V supplies the chip, which make the USB-I2C conversion and provide a 3.3V source by using the onboard 5V-to-3.3V LDO. The jumper on SW10 must be installed between pin 1 and pin 2 to select the converted onboard 3.3V instead of the external power supply.

#### Loading and Launching the Software

To install the MIC3003 software and the evaluation board drivers for the first time, please consult the *MIC3003 Evaluation Software Setup Guide*. It can be found online or in the zipped installation package.

#### Checking and Preparing the Board

The board comes with the following default positions of the jumpers:

SW#	Jumper Position	Function
SW1	Pin2-Pin3	VBIAS to drive NPN transistor
SW2	Pin2-Pin3	VILD- connected to GND
SW3	Pin1-Pin2	Unity gain in the bias –to-VMPD feedback
SW4	Pin2-Pin3	VMPD connected to the collector of Q3
SW6	Pin2-Pin3	VILD+ connected to the emitter of Q5
SW7	Pin2-Pin3	RS1 low
SW9	Pin2-Pin3	RS0 low
SW10	Pin1-Pin2	3.3V converted from USB 5V selected
SW11	1 ON 2 ON 3 ON	CLK from USB used SDA from USB used TXDISABLE low
SW12	7 ON	FB connected to VMPD

 Table 1. Jumper Positions

#### Warning!

When installing the device into the socket, make sure that pin 1 of the device corresponds to pin 1 of the socket marked with a dot in the lower left corner.

Before powering the board by installing the jumper on SW10, it is important to check that the jumpers on SW1, SW2, SW4, and SW6 are all in the default setting positions indicated in the table above. In that setting, the bias and feedback to FB/VMPD are referenced to GND which corresponds to driving a common anode laser. To set the bias and FB/VMPD reference to VCC corresponding to driving a common cathode laser, all those positions must be changed together to avoid any surge of current on the board.

To proceed to any change in the board setting, first VMOD and VBIAS must be disabled by using enable/disable bit, or by inserting DXDISABLE high (SW11-3 off), then program the MIC3003 to the new setting (see OEMCFG0-2 panel) before enabling VMOD and VBIAS again.

#### MIC3003 Initialization and Testing

Please follow the steps outlined in the MIC3003 Evaluation Software Manual found at page 8 of this document.

# **Evaluation Board Schematics**





# **Evaluation Board Schematics**



Schematic 2 of 2

# PCB Layout/Assembly



# **Bill of Materials**

ltem	Part Number	Manufacturer	Description	Qty.
C1		Vishay <sup>(1)</sup>	0.018µF Ceramic Capacitor, Size 0402	1
C2-3, C8, C11, C13		Vishay <sup>(1)</sup>	0.1µF Ceramic Capacitor, Size 0402	5
C4		Vishay <sup>(1)</sup>	0.033µF Ceramic Capacitor, Size 0402	1
C5-6, C14		Vishay <sup>(1)</sup>	0.01µF Ceramic Capacitor, Size 0402	3
C9-10		Vishay <sup>(1)</sup>	27pF Ceramic Capacitor, Size 0402	2
C12, C19		Vishay <sup>(1)</sup>	2.2µF Ceramic Capacitor, Size 0402	2
C15-16		Vishay <sup>(1)</sup>	1µF Ceramic Capacitor, Size 0402	2
C17-18	ECSH0GY106R	Panasonic <sup>(2)</sup>	10µF, Y, Tantalum Solid Electrolytic Capacitor	2
D1	516-1425-1-ND	Digikey <sup>(3)</sup>	Green LED	2
J1	67068-8010	Molex <sup>(4)</sup>	USB Type B Receptacle Connector	1
J2	142-0701-851	Johnson Components <sup>(5)</sup>	SMA End Launch Receptacle Connector	1
L1-3		Vishay <sup>(1)</sup>	1.2µH Ferrite Bead Inductor, Size 1206	3
Q1-3	MMTB3906WT1	ON Semiconductor <sup>(6)</sup>	PNP Transistor	3
Q4-6	MMTB3904WT1	ON Semiconductor <sup>(6)</sup>	NPN Transistor	3
R1-2, R5-6	CRCW040210R0F	Vishay <sup>(1)</sup>	10Ω Resistor	4
R3-4	CRCW04023R30F	Vishay <sup>(1)</sup>	3.3Ω Resistor	2
R7-12, R17-18, R21, R31-32, R34-35	CRCW04021002F	Vishay <sup>(1)</sup>	10kΩ Resistor	13
R13-16, R19-20	CRCW04021000F	Vishay <sup>(1)</sup>	100Ω Resistor	6
R22, R29	CRCW04021501F	Vishay <sup>(1)</sup>	1.5kΩ Resistor	2
R23-24	CRCW040227R0F	Vishay <sup>(1)</sup>	27Ω Resistor	2
R27-28	CRCW04022700F	Vishay <sup>(1)</sup>	270Ω Resistor	2
R30	CRCW04021001F	Vishay <sup>(1)</sup>	1kΩ Resistor	3
R33	CRCW04024700F	Vishay <sup>(1)</sup>	470Ω Resistor	1
SW1-10	TSW-1-3-07-G-S	Samtec <sup>(7)</sup>	Header, 3 Positions	4
SW11-12	TDA08H0SB1	CK-Components <sup>(8)</sup>	8 Positions Ultra Miniature Dip Switch	2
TP1-14, TP17-21	5014	Keystone <sup>(9)</sup>	Color Coded PCB Test Point, Yellow	19
TP15	5011	Keystone <sup>(9)</sup>	Color Coded PCB Test Point, Black	1
TP16	5010	Keystone <sup>(9)</sup>	Color Coded PCB Test Point, Red	1
VR1, VR2, VR3	3269 W-1-503 GLF	Bourns <sup>(10)</sup>	50K SMD Trimming Potentiometer	3
Y1	Q21CA3100xxxx00	Epson Toyocom <sup>(11)</sup>	6MHz Crystal	1
U1	24QN50K14040-0	Plastronics <sup>(12)</sup>	MLF-24 Socket	1
U2	FT2232D	FTDI Chip <sup>(13)</sup>	USB to Serial UART	1
U3	MIC862	Micrel, Inc. <sup>(14)</sup>	Dual Op Amp	1
U4	MIC5225	Micrel, Inc. <sup>(14)</sup>	LDO	1

#### Notes:

1. Vishay: <u>www.vishay.com</u>

2. Panasonic: <u>www.panasonic.com</u>

3. Digikey: <u>www.digikey.com</u>

- 4. Molex: <u>www.molex.com</u>
- 5. Johnson components: <u>www.johnsoncomponents.com</u>
- 6. ON Semiconductor: <u>www.onsemi.com</u>
- 7. Samtec: <u>www.samtec.com</u>
- 8. CK-Components: <u>www.ck-components..com</u>
- 9. keystone: <u>www.keyelco.com</u>
- 10. Bourns: <u>www.bourns.com</u>
- 11. Epson Toyocom: <u>www.epsontoyocom.co.jp</u>
- 12. Plastronics: <u>www.Plastronics..com</u>
- 13. FTDI Chip: www.ftdichip..com
- 14. Micrel, Inc.: <u>www.micrel.com</u>

# **MIC3003 Evaluation Software Manual**

Thank you for choosing to evaluate the MIC3003 FOM Management IC. This manual will outline the features of the MIC3003 Evaluation Software as well as the steps to setting up your MIC3003. Before reading this document, you should make sure the MIC3003 Evaluation Software is installed and the board can be properly interfaced. If not, please read the *MIC3003 Evaluation Software Setup Guide* first. For the *MIC3003 Evaluation Software Setup Guide*, please visit Micrel's Website or look inside the software package. To ensure the software runs smoothly, please close other background applications.

If you have any questions or encounter any issues, please contact Micrel HBW Helpline at (408) 955-1690 or email at <u>hbwhelp@micrel.com</u>.

Make sure a valid MIC3003 chip is mounted on the evaluation board. Choose either Single Chip or Multi-chip operation. If Single chip operation is chosen, the user needs to input MIC3003 Base Address. The default base address is A0. If Multi-chip operation is chosen, the program will scan all the address on the BUS to locate available MIC3003 devices. **Note:** this could take over a minute

Choose which MIC3003 device to be programmed and click the GO button.

		Devi	ce Status	5		
IC3003 Base A (0	ddress 0 - F0) C0		V PA:	SSWORD		
MFG ID	2A	DEVID 30		IE REV	0	
	Single C	hip Operation		_		_
	O Multiple	Chip Operation		INI	TIALIZE MIC3003	

	m DETECTED DEVICES	
	Choose MIC3003 Device	
MIC3003 Base Address (00 - F0) MFG ID 2A	Device1 Base Address: C0 Device2 Base Address: D0 Device3 Base Address: E0 Device4 Base Address: F0	
⊖ Sing ⊙ Mult	GO	ZE MIC3003

This is the Main screen of the MIC3003 program. The LEDs are either lit [RED] or dim [GRAY]. Lit LEDs usually indicate some alarm/warning or fault has been asserted and could be a sign of a problem.

The top menu bar is broken into 4 main drop-down menus. Utilities, Panels, Calibration, and Help.

UNINES FARES CAMPIANDIT TIED					
ARDWARE CONTROL	HARDWARE STATU	S			
TX STATUS RATE SELECT O TXDisable O 4.250bps + ① TXEnable O 4.250bps or lowe	RRSOUT	SHUT DOWN	VIN/INT	RXLOS	TXFAULT
AULT STATUS	ALARMS/WARNING	S TUS AL	ARM	WAF	RNING
APC SATURATION/TX POWER	TX POWEF	R O	MAX	MIN	MAX
BIAS CURRENT	RX POWEF	۹ O	0	٥	•
DIODE FAULT	BIAS CURF	RENT O	0	0	•
UNDER VOLTAGE LOCKOUT	VOLTAGE	•	0	0	٥
	TEMPERA	TURE O	0	0	•

## Utilities:

- Initialization Allows parts to be initialized. Registers are read into the program
- Hex/Bin/Dec Converter A handy tool to convert one number format to another
- Save and Load State Saves registers into a \*.mic and loads \*.mic files into the registers, respectively
- Exit Prompts you to save then exit the program

Utilities	Panels	Calibration	Help	
Init He:	ialization x/Bin/Dec C	Converter		HARDWARE STATUS
Sav Loa	ve State ad State	Ctrl+S Ctrl+O	LECT bps +	RRSOUT
Exi	t		ibps or lower	

# Panels:

- User Can read/update various Control and Status Registers
- **Results/Thresholds** Displays real-time measured results. Also allows the user to set the Alarm/Warning thresholds
- **OEM 0-2/3-4/5-6** Allows the user to read/update OEM Registers 0 to 6 with different settings for various applications
- **OEM Settings** To set the APC/MOD setpoints as well as the thresholds for various Fault conditions
- Alarm Warning Mask The user can chose which alarm/warning to mask as to not assert the Interrupt signal
- All Registers Can set and display any registers

Utilities	Panels	Calibration Help		
HARDWA TX S O TX	Us Re OE	er sults/Thresholds IM CONFIG 0-2 IM CONFIG 3-4		HARDWARE STATUS
<b>ג</b> ⊺	OE Ala Al	M CONFIG 5-6 M Settings arm Warning Mask Registers	twer	•

# Calibration:

- **Temp Comp** Sets user/autocalculated LUT values to compensate for 4 temperatureaffected parameters
- External Calibration If Ext. Calib. option is chose, sets coefficients for external calibration of the ADC results
- Set Coefficients Set coefficients for internal calibration of the ADC results
- Set RXPWR Delimiters If custom delimiter option is chosen, saves the user's delimiters in registers
- **RXPWR/LOS** Sets the calibration values for the RX PWR based on the delimiters.

Now let's go through the panels one-byone.

One of the useful tools built into the program is the HEX/BIN/DEC converter. It converts a number between those three formats. This tool can be found in the Utilities menu or under All Registers panel in Panels menu.

Jtilities Panels	Calibration	Help		
ARDWARE CONT	Tempe Extern	rature Compensation al Calibration	WARE STATUS	
TX STATUS	Intern	al Calibration	Set Coefficien	ts
O TXDisable	0	4.25Gbps +	Set RXPWR De	elimiters
• TXEnable	۲	4.25Gbps or lower	RXPWR/LOS C	onfig

HEX/B	BIN/DEC CO	<b>VVERTER</b>			
HEX -	> BINARY -> [	DECIMAL CONVERTER	}		
HEX	A	Convert ==>	BIN 1010	DEC	10
BIN	1011	Convert ==>	HEX B	DEC	11
DEC	12	Convert ==>	HEX C	BIN	1100

All Registers panel allows the user to read and write into any specific register by using the Serial and Register address. For example, to read the MFG ID, the Serial address would be 6 and Register address would be 254. Click "Get Current" will read the specified register and "Set New" will set a new value if the register is writeable.

"Read A2" and "Read A6" buttons will read the respective memory banks and display all user-related registers in an easy to read manner with description of each register.

To change any specific register entry, the user can use the textboxes in the "Set New" section.

L REGISTERS PANEL			
SERIAL ADDRESS REGISTI (0, 2, 4, 6) (0	ER ADDRESS ) - 255) 254 🛋	REGISTER ADDRESS (HEX)	
·	234 💌	12	
Get Current DEC 42	HEX	2A	
Set New DEC	HEX		
A2 Registers			
			Read A2
		~	
D9 RxPower Delimiter 4 LS:	0	~	
DA RxPower Delimiter 5 MS:	0		
DC ByDower Delimiter 6 MS.	0		
DD RxPower Delimiter 6 LS:	0		Devilag
FB POH Hi byte:	0		Read Ab
FC POH Lo byte:	0		
FD Data Ready:	F8		
FE Manufacturing ID:	2A		
rr Revision ID:	×30:	~	
HEX -> BINARY -> DECIMAL CONVERT	ER		
HEX FE Convert ==>	BIN 11111110	DEC 254	
PIN Convert>	HEX	DEC	
Bin Convert ==>		a second a second se	

To start setting up the MIC3003, go to **Panels** menu and select **OEM CONFIG 0-2**. This will allow the user to modify the OEM Configuration Registers 0 - 2.



**OEM CONFIG 0-2** panel allows the user to alter the OEM Configuration Register settings by selecting the desired option and clicking "Update Register ..."

#### **OEM Register 0:**

Set VMOD Reference to:

a) **VDD** if the SY89307V is used as the driver OR a common cathode VCSEL laser is used.

b) **GND** if a FP/DFB or a common anode VCSEL is used (without the SY89307V).

#### **OEM Register 1:**

- Set APC OP-AMP to: Emitter Follower
- Set Feedback Voltage to: 1.22V
- Set Bias Reference and VBIAS Drive to:

a) **GNDA** and **Source (NPN)** if a FP/DFB or common anode VCSEL is used

b) **VDD** and **Sink (PNP)** if a common cathode VCSEL is used

• Set Internal Feedback Resistor to: **Any Value** that converts the photodiode current to a voltage within 400-800mV to avoid APC saturation.

#### **OEM Register 2:**

- The MIC3003 address can be modified.
- Set TRSTCLR Time to: Any Time to control the delay between QGPO de-assert and RESETOUT clearing.

#### **OEM Register 0:**

• Set Output Enable to: Enable

SHDN, VMO OUTPUT F	ID, VBIAS ENABLE : ble GE TO REPORT I O VBIA O FLTI EGISTER 0	VM N VINh:VINI AS DAC	OD REFERENCE VDD GND
SHDN, VMO OUTPUTE Hi-Z ELECT VOLTA VDDA VDDA UPDATE R	ID, VBIAS ENABLE del GE TO REPORT I VBIA O FLTI EGISTER 0	VM N VINh:VINI AS DAC	OD REFERENCE VDD GND VMOD
Hi-Z     ELECT VOLTA     VDDA     MODDAC     UPDATE R	: GE TO REPORT I VBI/ O FLTI EGISTER 0	N VINh:VINI AS DAC	<ul> <li>∨DD</li> <li>GND</li> <li>O VMOD</li> </ul>
C Ena	IGE TO REPORT I VBIA FLTI EGISTER 0	N VINh:VINI AS DAC	GND VMOD
ELECT VOLTA VDDA MODDAC UPDATE R	GE TO REPORT I	N VINH:VINI AS DAC	
VDDA MODDAC UPDATE R	O VBIA O FLTI EGISTER 0	AS DAC	O VMOD
O MODDAC	O FLTI	DAC	
UPDATE R	EGISTER 0		
K VOLTAGE	BIAS REFERE	NCE	VBIAS DRIVE
1.22V	💿 GNDA		O Sink (PNP)
312.5mV			<ul> <li>Source (NPN)</li> </ul>
IN	TERNAL FEEDBA	CK RESISTO	)R
0 800	🔘 1.6K	O 3.2K	◯ 6.4K
O 12.8K	🔘 25.6K	O 51.2K	INF
UPDATE R	EGISTER 1		
		TRSTCLF	R TIME
	0	Zero Delau	○ 17.5 ms
	② 22	.5 ms 0 2	27 ms () 45 ms
UPDATE R	EGISTER 2		
	I12.5mV 0 800 0 12.8K UPDATE R UPDATE R	12.5mV VDD INTERNAL FEEDBA 0 800 0 1.6K 0 12.8K 0 25.6K UPDATE REGISTER 1 0 22 UPDATE REGISTER 2	I12.5mV VDD INTERNAL FEEDBACK RESIST 800 1.6K 3.2K 12.8K 25.6K 51.2K UPDATE REGISTER 1 TRSTCLF 2ero Delay 22.5 ms 3 UPDATE REGISTER 2

**OEM CONFIG 3-4** panel in **Panels** menu allows the user to alter the OEM Configuration Registers 3 & 4 by selecting the desired option and clicking "Update Register ..."

The user can select any of options based on individual applications. A sample selection could be:

**External** Calibration

Enable RXLOS

SHDN

Active Low

Latched Alarms

Latched Warnings

Do Not Assert TXFAULT on Alarms

Do Not Assert TXFAULT on Warnings

ISTART can be set to different values to speed up the APC loop during laser Turn-On after a FAULT occurrence.

QGPO settings will depend on the user's application.

"Test Reset" is provided to evaluate the Reset signal. Hit the button to send a Reset pulse from the MIC3003. Hit Okay to the information box that follows.

#### OEM CONFIG 5-6 panel in Panels

menu allows the user to alter the OEM Configuration Registers 5 & 6 by selecting the desired option and clicking "Update Register ..."

Please refer to the MIC3003 Datasheet to determine the desired settings.

	FIGURATION		
OEM REGISTER 3			
CALIBRATION	RXLOS	SHDN/T×FIN SEL	TXFIN POLABITY
<ul> <li>External</li> </ul>	<ul> <li>Enabled</li> </ul>	SHDN	Active-Low
Internal	O Disabled	O TXFIN	O Active-High
	GPO CI	ONTROL	
GPO OUTPUT	GPO/RRSOUT SEL	GPO OUTPUT TYPE	QGPO SEL
<ul> <li>Low</li> </ul>	RRSOUT	Open-Drain	O GPO
🔿 High	O GPO	O Push-Pull	Reset Output
	UPDATE R	EGISTER 3	TEST RESET
OEM REGISTER 4			
OEM REGISTER 4	ISTART SEL 0.00	00 m.A 💌	
OEM REGISTER 4	ISTART SEL 0.00	00 mA 💌	TXFAULT ON WARNINGS
OEM REGISTER 4	ISTART SEL 0.00 WARNING LATCH	00 mA	TXFAULT ON WARNINGS

DEM REGISTER 5			
DAC RESET	SMBUS TIMEOUT	PASSWORD LOCATION	MULTIPART
Olear	<ul> <li>Enabled</li> </ul>	<ul> <li>Default</li> </ul>	⊙ Off
O Save	O Disabled	O A6h: 123-126	O On
TXFAULT	TEMP OFFSET	LUT TEMP OFFSET	SHUTDOWN ON TXFAULT
<ul> <li>Active-High</li> </ul>	No Offset	No Offset	<ul> <li>Enabled</li> </ul>
O Active-Low	O Compensated	O Compensated	O Disabled
DEM REGISTER 6	UPDATE R	EGISTER 5	
DEM REGISTER 6		EGISTER 5	
DEM REGISTER 6 TXFAULT CLEAR TOggle TXDISABLE	UPDATE R TEMP RESOLUTION	RXLOS/TRSOUT	RXLOS POLARITY
DEM REGISTER 6 TXFAULT CLEAR Toggle TXDISABLE Self-Maintained	UPDATE R TEMP RESOLUTION ① 1 Degree ○ 0.5 Degree	RXLOS/TRSOUT RXLOS RXLOS TRSOUT	RXLOS POLARITY <ul> <li>LOS-High</li> <li>LOS-Low</li> </ul>
DEM REGISTER 6 TXFAULT CLEAR TXFAULT CLEAR Self-Maintained TXDISABLE DEBOUNCE	UPDATE R TEMP RESOLUTION 1 Degree 0.5 Degree RXPWR LINEARIZATI	RXLOS/TRSOUT RXLOS RXLOS TRSOUT INNTERVALS	RXLOS POLARITY   LOS-High  LOS-Low  A0h ACCESS
DEM REGISTER 6 TXFAULT CLEAR TXFAULT CLEAR TXDISABLE TXDISABLE TXDISABLE DEBOUNCE TXDISABLE DEBOUNCE TXDISABLE DEBOUNCE	UPDATE R TEMP RESOLUTION 1 Degree 0.5 Degree RXPWR LINEARIZATI Temp-Based Coeff's	RXLOS/TRSOUT RXLOS RXLOS TRSOUT ION INTERVALS Hardcoded Delimit	RXLOS POLARITY LOS-High LOS-Low A0h ACCESS SFF-8472 Complian

# Select **OEM SETTINGS** panel in **Panels**

menu to enter the setpoints and thresholds. Valid DAC values are between 0 and 255. Hit "Set New" to store any changes.

APC setpoints sets the bias of the laser. The three APC setpoints can be used to set three levels of bias current. Only one can be used at a time. APC setpoint 0 is selected by default.

MOD settings work with the MOD current of the laser.

To change which setpoint is used, go to **USER** panel in **Panels** menu.

Various FAULT and INTERRUPT masks can be set here as well. A fault shuts down the bias and modulation of the laser. When masking a fault, be aware that the bias and modulation currents can go too high and damage the board/laser. To avoid any damage, the fault should be masked for a short time only. Once the fault is identified, unmask the faults and fix the problem.

Under **Panels** menu, select **Alarm Warning Masks** to set the bits that mask the alarm or warning source of INTERRUPT

OEM SETTINGS P	ANEL			
	SET	POINTS	5 AND THRESHO	ILDS
			DECIMAL	HEXADECIMAL
GET CURRENT	APC SETPOII	NT O	30	1E
	APC SETPOII	NT 1	0	0
SETINEW	APC SETPOII	NT 2	0	0
	MOD SETTI	NG O	30	1E
	MOD SETTI	NG 1	0	0
	MOD SETTI	NG 2	0	0
IBIAS	FAULT THRESH	OLD	200	C8
TX POWER	FAULT THRESH	OLD	200	C8
LOSS-OF-S	IGNAL THRESH	OLD	0	0
FAULT S	JPPRESSION TH	MER	0	0
		FAU	LT MASK	INTERRUPT MASK
Power On Hour	s	🗌 A	PC SAT	MASKED
Change OEM Pass	word		× POWEB	
Change out 1 dee				POWER-ON HOUR METER
OEM Scratchpa	d	B	IAS CURRENT	
		D	IODE FAULT	
Manufacturer and De	vice ID		_	



# Under **Calibration** menu, select **Temperature Compensation** to load/create various Compensation Look-Up Tables.

The "Read ... LUT Values" buttons will read the content of the respective LUT from memory and display the values on the right.

The "Load ... LUT Values" buttons will prompt the user to locate and read in an existing LUT file. The file should be in note pad format containing two columns of numbers separated by a TAB. The left column represents the temperature index, ranging from 0 to 75, corresponding to the 150°C temperature range. The right column is the delta to be applied to the parameter value at that particular temperature.

If the user wishes for a simple way to populate the respective LUT without having to create 75 entries, the MIC3003 software provides the LUT Input Wizard.

To use the Wizard, click on "LUT Input Wizard" on **Temperature Compensation** panel. Choose which LUT should be automatically filled, then choose how many delta points should be predefined. The program will automatically generate the rest of the LUT values linearly between the specified points. The Wizard needs a minimum of 2 points and a maximum of 8 points.

For example, if 5 points are picked, the program will ask for 3 index values (0 and 75 are always required) and 5 LUT values.

PERATURE COMPENSATION LOOK-UP	TABLE	Le le	JE
	1044	LOOK-UP TABLE (LUT) VALUES	
	APC LUT	Offset Value	
LUT INPUT WIZARD	0	0	
	1	0	
	2	0	
	3	0	
READ APC TEMP COMP LUT VALUES	4	0	
	5	0	
LOAD EXTERNAL APC LUT FILE	6	0	
	7	0	
	8	0	
	9	0	
	10	0	
READ IMOD TEMP COMP LUT VALUES	11	0	
	12	0	
LOAD EXTERNAL IMOD LUT FILE	13	0	
	14	0	
	15	0	
	16	0	
READ BIAS FAULT LUT VALUES	17	0	
neno bromber cor medeo	18	0	
	19	0	
LOAD EXTERINAL FAULT LUT FILE	20	0	
	21	0	
	22	0	
	23	0	
READ BIAS ALARM LUT VALUES	24	0	
	25	0	
LOAD EXTERNAL ALARM LUT FILE	26	0	
conserver and even and estimate	27	0	
	28	0	

NUMBER OF POINTS
5
<u>।</u>
HELP

INPUT WIZARD								_ 0
	ENTER THE VALU	E CORRESPOND	ING TO THE ENT	RY NUMBER				
ENTRY NUMBER	0	10	20	60	75	N/A	N/A	N/A
VALUE	0	10	30	40	45			

The program will save the LUT values in a separate file so it can be used multiple times without having to repeat the Wizard. The user can click "Load…LUT values" button to read in these files in the future.



		LOOK-UP TABLE (LUT	VALUES
	APC COMP	VALUES	
LUT INPUT WIZARD	0	0	
	1	1	
	2	2	
	3	3	
READ APC TEMP COMP LUT VALUES	4	4	
	5	5	
LOAD EXTERNAL APCILITELE	6	6	
	7	7	
	8	8	
	9	9	
READ INOD TEMP COMPLIATIVALUES	10	10	
READ IMOD TEMP COMP LUT VALUES	11	12	
	12	14	
LOAD EXTERNAL IMOD LUT FILE	13	16	
	14	18	
	15	20	
	17	22	
READ BIAS FAULT LUT VALUES	18	24	
	19	28	
LOAD EXTERNAL FAULT LUT FILE	20	30	
	21	30	
	22	30	
	23	30	
READ BIAS ALARM LUT VALUES	24	31	
TIEAD DIAS ABAININE OT VALUES	25	31	
	26	31	
LOAD EATERINAL ALARM LUT FILE	27	31	
	28	32	

The LUT values are generated automatically and saved to the MIC3003.

On **Calibration** menu, select **External Calibration** to adjust offsets and slopes constants. These constants are used if External Calibration is selected in OEM Configuration Register 3.

For quick start:

- Set all offsets to 0 and slopes to 1
- Set RX\_PWR(1) to 1

These parameters might need to be changed later to correct the measured values.

EXTERNAL CALIBRA	ATION PANEL		D					
CALIBRATION CONSTANTS								
TEMP (OFFSET)	0.0 🐑	TEMP (SLOPE)	1.000 🚭					
VOLTAGE (OFFSET)	0.0000 🔿	VOLTAGE (SLOPE)	1.00000 😂					
TXPWR (OFFSET)	0.0000 😂	TXPWR (SLOPE)	1.00000 🔶					
TX_I (OFFSET)	0.0000 🚔	TX_I (SLOPE)	1.00000 🜪					
RXPWR (0)	0.0000 😂							
RXPWR (1)	1.0000 🚔	SET NEW CA	LIBRATION					
RXPWR (2)	0.0000 🜪	GET CURREN	T SETTINGS					
RXPWR (3)	0.0000 🔿	Temp: -16 - 15.5	5 <u>C</u>					
RXPWR (4)	0.0000 🔿	Voltage: -3.27 - 3. Current: -65.5 - 65 Power: -3.27 - 3.2	27 V 5.5 mA 27 mW					

On **Panels** menu, select **User** to change user options.

Here the various APC and MOD setpoints can be selected. APC SET0 and MOD SET0 are selected by default.

M USER PANEL		
CONTROL AND STATUS REGISTER		
UPDATE REGISTER	TX FAULT • TX RATE <4.25Gb	5
POWER-ON DONE BYLOS	TX DISABLE O RX RATE <4.25Gb	
STATUS DONE RALOS O	DISABLE TX	
UPDATE REGISTER	APC SET0      MO     RON INT MASK	OD SETO
	O APC SET1 O M	OD SET1
PWRON INT	APC SET2 O MO	OD SET2
POWER ON HOUR METER		
DURATION OF USAGE		
POWER-ON HOURS FAULT	S 0 HOUR RES	ET
PASSWORD PROTECTION		
ENTER OEM PASSWORD	Note: Valid USER or OEM password required to write to the User Control Register, A0 Register and Scratchpa A0 REGISTERS	ad PAD

Thresholds and Results panel can be found under **Panels** menu or by clicking "View Thresholds" button on the main window.

The calibration type is displayed as well as measured results from the MIC3003 evaluation board. The user can toggle between auto-refreshing the results every 0.5 seconds or every 1.5 seconds.

The LEDS in the bottom section signal if any Alarm/Warning threshold has been violated. To set new limits, type in the desired values and hit "Set New Limits". The LED's should respond to the new limits automatically.

Hit "Current Limits" to read the limits currently stored in the chip

Hit "Get A/W Status" to refresh the LEDs if they don't update automatically.

If the user requires Internal Calibration, there are three panels to complete. **Set Coefficients**, Set **PXPWR Delimiters** and **RXPWR/LOS Configuration** 

FHRESHOLDS AND F	RESULTS						(	
A REASURED RESULTS								
REFRESH	TX OPTICAL POWER (mW)	RX OPTICAL P	OWER 6	BIAS CURRENT (mA)	VOL.	TAGE V)	TEMPEI (	RATUR C)
0.5 sec Update	DEC 6.528	DEC	0 DEC	130.56	DEC	0	DEC	23
O 1.5 sec Update	HEX 1980	HEX	0 HEX	1FE00	HEX	0	HEX	17
CALIBRATION TYPE								
	RESHOLDS							
LARM/WARNING THF	RESHOLDS	ALAR	M THRESHOLI	DS	WAF	RNING THR	RESHOLDS	
LARM/WARNING THE	RESHOLDS	ALAR	M THRESHOLI	DS IMUM	WAF MINIMU	RNING THF	RESHOLDS MAXIMUN	1
LARM/WARNING THE	RESHOLDS TX POWER (0-6.528mW)	ALAR MINIMUM	M THRESHOLD MAX	0 0	WAF	RNING THE	RESHOLDS MAXIMUN	n D 👄
LARM/WARNING THE CURRENT LIMITS SET NEW LIMITS	TX POWER (0-6.528mW) RX POWER (-6.528mW)	ALAR MINIMUM ) 0		DS IMUM 0 ● 0 ●	WAF		RESHOLDS MAXIMUN	1 D •
CURRENT LIMITS SET NEW LIMITS GET A/W STATUS	TX POWER           (0-6 528mW)           RX POWER           (0-6 528mW)           BLAS CURRENT           BLAS CURRENT	ALAR MINIMUM ) 0 ) 0 ) 0 ) 0		DS IMUM 0 • 0	WAF		RESHOLDS	
CURRENT LIMITS SET NEW LIMITS GET A/W STATUS	TX POWER           (0-6 528mW)           (0-5 528mW)           BIAS CURRENT           (0-130.56mA)           VOLTAGE           (0-5280)	ALAR MINIMUM ) 0 ) 0 ) 0 ) 0 1 (0)		DS IMUM 0 • 0 • 0 •	WAF MINIML			

Itilities Panels	Calibration	Help	
ARDWARE CONT	TF Tempe Extern	rature Compensation al Calibration	WARE STATUS
TX STATUS	0	4.25Gbps +	Set RXPWR Delimiters RXPWR/LOS Config

The **Set Coefficient** panel will allow the user to set the Slope and Offset coefficients for internal calibration.

For quick start:

• Set Slopes to 1 and Offset to 0



If Internal Calibration is selected in **OEM Configuration Register 3**, the Receive Power is calibrated by applying slope and offsets tailored to separate ranges of the Receive Power.

On the **Receive Power Range Limits**, the user can enter the delimiter values to specify the receive power linearization intervals. These delimiters will be used if "Programmable Delimiters" option is selected in **OEM Configuration Register 5**.

RXLUTO	0.0000	to	1	Wm
RXLUT1	1	to 📃	2.12	mW
RXLUT2	2.12	to	3.0147	mW
RXLUT3	3.0147	to	4	mW
RXLUT4	4	to	4.125	mW
RXLUT5	4.125	to	5.31	mW
RXLUT6	5.31	to 🗌	6.211	mW
RXLUT7	6.211	to	6.5535	mW

To apply slope and offset for each of the	RECEIVE POWE	RECEIVE POWER CALIBRATION				
RXPWR/LOS Config on Internal		SLOPE	OFFSET			
Calibration submenu.	RXLUT0	1	0	0.0000 to 1	mW	
RXPOT ratio can be set here as well. Refer to datasheet for desired settings.	O RXLUT1	1	0	1 to 2.12	mW	
The delimiters on the right will	O RXLUT2	1	0	2.12 to 3.0147	mW	
correspond to whichever selected option in <b>OEM Configuration Register 5</b> .	O RXLUT3	1	0	3.0147 to 4	mW	
	O RXLUT4	1	0	4 to 4.125	mW	
set here as well.	O RXLUT5	1	0	4.125 to 5.31	mW	
	O RXLUT6	1	0	5.31 to 6.211	mW	
	O RXLUT7	1	0	6.211 to 6.5535	mW	
		GET CURREN	IT SET	TNEW		
	RXPO		djustment 🔽	SAVE		
				LOS ASSERT LEVEL (mV)	0	
	MEASURE			DE-ASSERT LEVEL (mV)	0	

TARGET

DELTA

The MIC3003 setup is complete. Depending on the specific application, your settings may vary from those listed above. For detailed descriptions of settings, please consult the datasheet. Please contact Micrel if there are any technical or software issues

RESULT

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