



APPLICATION NOTE 4110

DS1865 Quick Reference Guide

Abstract: The DS1865 burst-mode PON controller with integrated monitoring provides programming options required to configure the alarms, warnings, lookup tables, and other functions detailed in Application Note 4052, [Quick Reference Guide to the DS1863 Memory Map](#). This programmability necessitates a large register memory map. This application note provides an alternate outline of the register map, which is convenient when programming the device.

Introduction

The [DS1865](#) is a burst-mode PON controller with integrated monitoring capabilities. It features seven separate memory tables that are internally organized into eight byte rows. In addition this controller has auxiliary memory, which is EEPROM accessible at the A0h slave address.

Memory Map of the DS1865

The **Lower Memory** is addressed from 00h to 7Fh. This memory contains alarm and warning thresholds, flags, masks, several control registers, password entry area (PWE), and the Table Select byte. See **Figure 1**.

Table 01h primarily contains EEPROM (with PW1-level access) and some alarm and warning status bytes.

Table 02h is a multifunction space that contains configuration registers, scaling and offset values, passwords, interrupt registers, and other miscellaneous control bytes.

Table 03h is strictly EEPROM that is protected by a PW2-level password.

Table 04h contains a temperature-indexed lookup table (LUT) for controlling the modulation voltage. The modulation LUT can be programmed in 2°C increments over the -40°C to +102°C range. Access to this LUT is protected by a PW2-level password.

Table 05h contains another LUT which allows the APC set point to change as a function of temperature to compensate for Tracking Error (TE). The TE LUT has 36 entries that determine the APC setting in 4°C windows between -40°C to +100°C. Access to this LUT is protected by a PW2-level password.

Table 06h contains a MON4-indexed LUT for controlling the M4DAC voltage. The M4DAC LUT has 32 entries that are configurable to act as one 32-entry LUT or two 16-entry LUTs. When configured as one 32-entry LUT, each entry corresponds to an increment of 1/32 of the full scale. When configured as two 16-entry LUTs, the first 16 entries and the last 16 entries each correspond to 1/16 of full scale. Either of the two 16-entry sections is selected with a separate configuration bit. Access to this LUT is protected by a PW2-level password.

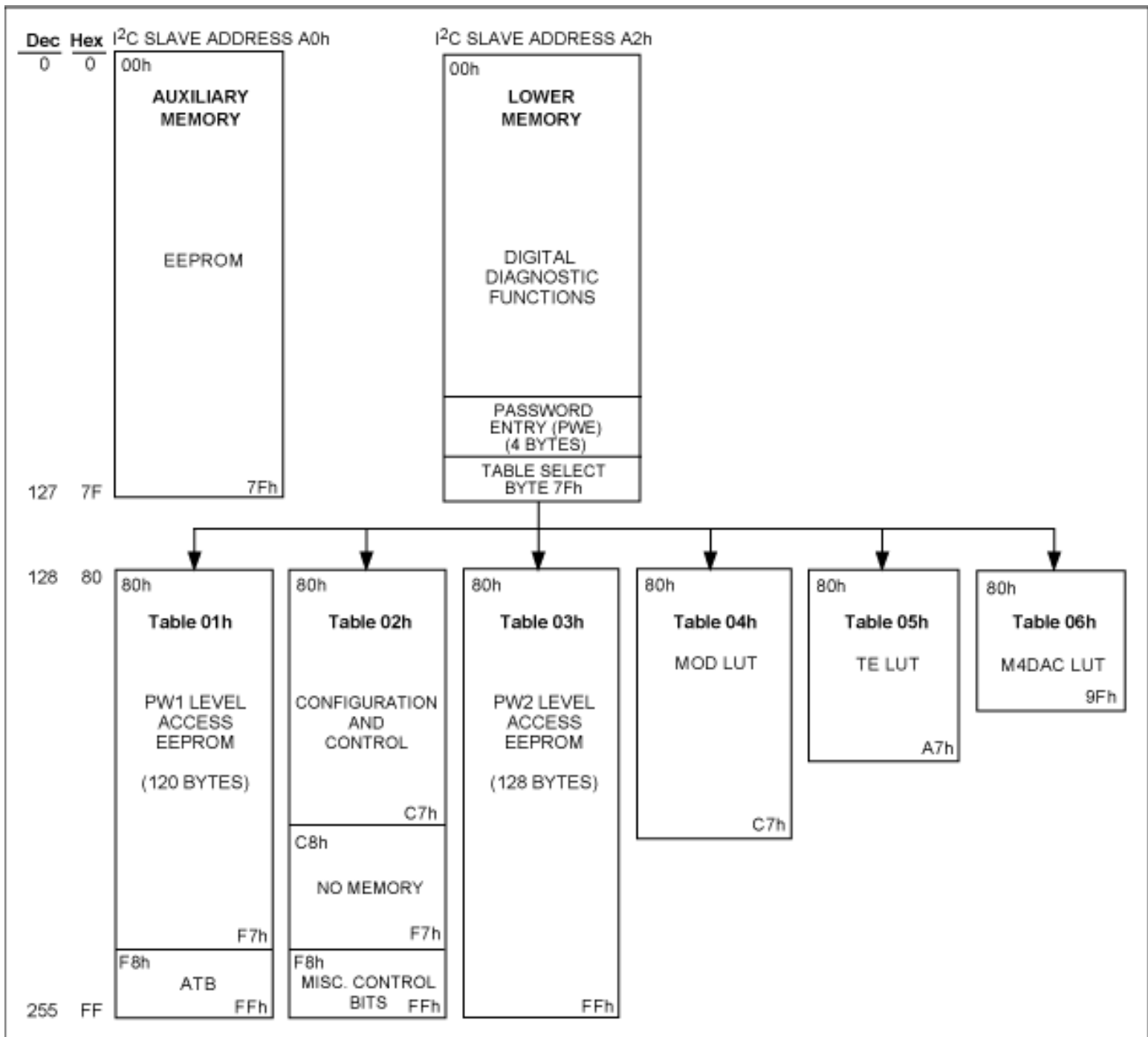


Figure 1. DS1865 memory map.

Register Reference

The following tables provide an easy reference to the Lower Memory, and Tables 01h and 02h. For a description of the functionality for each bit, please refer to the corresponding register in the DS1865 data sheet. Tables 03h, 04h, 05h, and 08h are LUTs that do not require a separate reference, and thus are not included here. (Please refer to the data sheet for detailed information about these tables.)

Note: RSVD is used as an acronym for Reserved.

Lower Memory Table

TEMP ALARM HI TEMP WARN HI	00h, 04h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	01h, 05h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
TEMP ALARM LO TEMP WARN LO	02h, 06h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	03h, 07h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
V _{CC} ALARM HI V _{CC} WARN HI	08, 0C, 10, 14, 18, 1C, 20, 24, 25, 2Ch	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
MON1-4 ALARM HI MON1-4 WARN HI	09, 0D, 11, 15, 19, 1D, 21, 25, 29, 2Dh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
V _{CC} ALARM LO V _{CC} WARN LO	0A, 0E, 12, 16, 1A, 1E, 22, 26, 2A, 2Eh	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
MON1-4 ALARM LO MON1-4 WARN LO	0B, 0F, 13, 17, 1B, 1F, 23, 27, 2B, 2Fh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
PW2 EE	30h-5Fh	EE	EE	EE	EE	EE	EE	EE	EE
TEMP VALUE	60h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	61h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
V _{CC} VALUE, MON1-4 VALUE	62, 64, 66, 68, 6Ah	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	63, 65, 67, 69, 6Bh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
RESERVED	6C, 6Dh	0	0	0	0	0	0	0	0
STATUS	6Eh	FETG STATUS	SOFT FETG	RSVD	TX-F RESET	SOFT TX-D	TX-F STATUS	LOS STATUS	RDYB
UPDATE	6Fh	TEMP RDY	V _{CC} RDY	MON1 RDY	MON2 RDY	MON3 RDY	MON4 RDY	RSVD	RSVD
ALARM ₃	70h	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
ALARM ₂	71h	MON3 HI	MON3 LO	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
ALARM ₁	72h	RSVD	RSVD	RSVD	RSVD	BIAS HI	RSVD	TX-P HI	TX-P LO
ALARM ₀	73h	RSVD	RSVD	RSVD	RSVD	BIAS MAX	RSVD	RSVD	RSVD
WARN ₃	74h	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
WARN ₂	75h	MON3 HI	MON3 LO	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
RESERVED	76, 77h	0	0	0	0	0	0	0	0
DOUT	78h	RSVD	RSVD	RSVD	RSVD	D3 OUT	D2 OUT	D1 OUT	D0 OUT
DIN	79h	RSVD	RSVD	INV LOSI	MUX LOSI	D3 IN	D2 IN	D1 IN	D0 IN
RESERVED	7Ah	0	0	0	0	0	0	0	0
PASSWORD ENTRY	7Bh	2 ³¹	2 ³⁰	2 ²⁹	2 ²⁸	2 ²⁷	2 ²⁶	2 ²⁵	2 ²⁴
	7Ch	2 ²³	2 ²²	2 ²¹	2 ²⁰	2 ¹⁹	2 ¹⁸	2 ¹⁷	2 ¹⁶
	7Dh	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸

	7Eh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
TABLE SELECT	7Fh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰

TABLE 01h

PW1 EEPROM	80h–F7h	EE	EE	EE	EE	EE	EE	EE	EE
ALARM ₃	F8h	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
ALARM ₂	F9h	MON3 HI	MON3 LO	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
ALARM ₁	FAh	RSVD	RSVD	RSVD	RSVD	BIAS HI	RSVD	TX-P HI	TX-P LO
ALARM ₀	FBh	RSVD	RSVD	RSVD	RSVD	BIAS MAX	RSVD	RSVD	RSVD
WARN ₃	FCh	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
WARN ₂	FDh	MON3 HI	MON3 LO	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
RESERVED	FE–FFh	0	0	0	0	0	0	0	0

TABLE 02h

MODE	80h	SEEB	RSVD	RSVD	M4DAC-EN	AEN	MOD-EN	APC-EN	BIAS-EN
T INDEX	81h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MOD DAC	82h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
APC DAC	83h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
V INDEX	84h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
M4DAC	85h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
DEVICE ID	86h	0	1	1	0	0	1	0	1
DEVICE VER	87h	DEVICE VERSION							
UPDATE RATE	88h	0	0	0	0	SR ₃	SR ₂	SR ₁	SR ₀
CONFIG	89h	FETG DIR	TX-F EN	RSVD	ASEL	RSVD	RSVD	RSVD	RSVD
START-UP STEP	8Ah	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵
MOD RANGING	8Bh	RSVD	RSVD	RSVD	RSVD	RSVD	MOD ₂	MOD ₁	MOD ₀
DEVICE ADDRESS	8Ch	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
COMP RANGING	8Dh	RSVD	BIAS ₂	BIAS ₁	BIAS ₀	RSVD	APC ₂	APC ₁	APC ₀
RIGHT SHIFT ₁	8Eh	RSVD	MON1 ₂	MON1 ₁	MON1 ₀	RSVD	MON2 ₂	MON2 ₁	MON2 ₀
RIGHT SHIFT ₀	8Fh	RSVD	MON3 ₂	MON3 ₁	MON3 ₀	RSVD	MON4 ₂	MON4 ₁	MON4 ₀
RESERVED	90–91h	0	0	0	0	0	0	0	0
V _{CC} SCALE MON1-4 SCALE	92, 94, 96, 98, 9Ah	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	93, 95, 97, 99, 9Bh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
RESERVED	9C–A1h	0	0	0	0	0	0	0	0
V _{CC} OFFSET MON1-4 OFFSET	A2, A4, A6, A8, AAh	S	S	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰
	A3, A5, A7, A9, ABh	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²
RESERVED	AC–ADh	0	0	0	0	0	0	0	0

TEMP OFFSET	AEh	S	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²
	AFh	2 ¹	2 ⁰	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶
PW1	B0h	2 ³¹	2 ³⁰	2 ²⁹	2 ²⁸	2 ²⁷	2 ²⁶	2 ²⁵	2 ²⁴
	B1h	2 ²³	2 ²²	2 ²¹	2 ²⁰	2 ¹⁹	2 ¹⁸	2 ¹⁷	2 ¹⁶
	B2h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	B3h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
PW2	B4h	2 ³¹	2 ³⁰	2 ²⁹	2 ²⁸	2 ²⁷	2 ²⁶	2 ²⁵	2 ²⁴
	B5h	2 ²³	2 ²²	2 ²¹	2 ²⁰	2 ¹⁹	2 ¹⁸	2 ¹⁷	2 ¹⁶
	B6h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	B7h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
FETG ENABLE ₁	B8h	TEMP EN	V _{CC} EN	MON1 EN	MON2 EN	MON3 EN	MON4 EN	RSVD	RSVD
FETG ENABLE ₀	B9h	HTXP EN	LTXP EN	BIAS HI EN	BIAS MAX EN	RSVD	RSVD	RSVD	RSVD
TX-F ENABLE ₁	BAh	TEMP EN	V _{CC} EN	MON1 EN	MON2 EN	MON3 EN	MON4 EN	RSVD	RSVD
TX-F ENABLE ₀	BBh	HTXP EN	LTXP EN	BIAS HI EN	BIAS MAX EN	RSVD	RSVD	RSVD	FETG EN
HTXP	BCh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
LTXP	BDh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
HBIAS	BEh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MAX IBIAS	BFh	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵
DPU	C0h	RSVD	RSVD	INV LOSI	MUX LOSI	D3 CNTL	D2 CNTL	D1 CNTL	D0 CNTL
RESERVED	C1–C3h	0	0	0	0	0	0	0	0
DAC1	C4h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
RESERVED	C5–C6h	0	0	0	0	0	0	0	0
M4 LUT	C7h	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	DBL_SB	UP_LOWB
MAN IBIAS	F8h	RSVD	RSVD	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷
	F9h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MAN_CNTL	FAh	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	MAN_CLK
BIAS DAC	FBh	0	0	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷
	FCh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
RESERVED	FD-FEh	0	0	0	0	0	0	0	0

Application Note 4110: <http://www.maxim-ic.com/an4110>

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Related Parts

DS1865: [QuickView](#) -- [Full \(PDF\) Data Sheet](#)

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