DT5790 & x780
HV Registers
Description

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MOD. DT5790
MOD. x780

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Disclaimer

MADE IN ITALY: We stress the fact that all the boards are made in Italy because in this globalized world, where getting the lowest possible price for products sometimes translates into poor pay and working conditions for the people who make them, at least you know that who made your board was reasonably paid and worked in a safe environment. (this obviously applies only to the boards marked "MADE IN ITALY", we cannot attest to the manufacturing process of "third party" boards).

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1 Address map

This chapter describes the accessible HV channel registers of DT5790 Digital Pulse Analyzer and x780 Digital MCAs, and the format of the read/write data.

Table 1: DT57xx HV Channel registers

CHANNEL n PARAMETERS (CH0 n = 2; CH1 n = 3)				
Address	*Register Name*	*Data type*	*Mode*	*Function*
0x1n20	VSET	16 bit	RW	Set channel voltage
0x1n24	ISET	16 bit	RW	Set channel current
0x1n28	RAMP UP	16 bit	RW	Ramp Up Rate
0x1n2C	RAMP DOWN	16 bit	RW	Ramp Down Rate
0x1n30	VMAX	16 bit	RW	Software VMAX
0x1n34	CONTROL	16 bit	RW	Control register
0x1n38	STATUS	16 bit	R	Channel Status
0x1n40	VMON	16 bit	R	Channel voltage monitor
0x1n44	IMON	16 bit	R	Channel current monitor

NOTE: “n” in the register address has to be intended as “2” for HV CH0 and “3” for HV CH1.

2 Registers description

See Technical Specifications of the relevant board for parameters allowed ranges.

2.1 VSET

Address	0x1n20
Resolution	0.1V
Description	This register can be used to set channel voltage: the set output voltage is given by the product between register value and Vset resolution; for example in order to set 2500 V, set register to 25000 (resolution 0.1 V).

2.2 ISET

Address	0x1n24
Resolution	DT5780: 10 nA; DT5790: 50 nA
Description	This register can be used to set channel current limit: set current is given by the product between register value and Iset resolution; for example in order to set 2000 µA (DT5790), set register to 40000 (resolution 50 nA).

2.3 RAMP UP

Address	0x1n28
Resolution	1 V/s
Description	This register can be used to set RAMP UP rate.

2.4 RAMP DOWN

Address	0x1n2C
Resolution	1 V/s
Description	This register can be used to set RAMP DOWN rate.

2.5 VMAX

Address	0x1n30
Resolution	20V
Description	This register can be used to set hardware max voltage, the Vmax is given by the product between register value and resolution.

2.6 CONTROL

Address	0x1n34		
Description	BIT 0	Power On/Off	0 : CH OFF 1 : CH ON
	BIT 1	Power Down Mode	0 : KILL 1 : RAMP
	BIT 7	Monitor Mode	0 : Vmon, Imon, Status. 1 : Analog In, Temperature In, A639 Firmware Release
	Other BITs	Reserved	

2.7 STATUS

Address	0x1n38
Description	this register allows to read STATUS word, whose bits mean: Bit 0 = 1 -> ON Bit 1 = 1 -> Ramp UP Bit 2 = 1 -> Ramp DOWN Bit 3 = 1 -> OVER CURRENT (IMON > ISET) Bit 4 = 1 -> OVER VOLTAGE (VMON > VSET + 2%) Bit 5 = 1 -> UNDER VOLTAGE (VMON < VSET - 2%) Bit 6 = 1 -> MAX VOLTAGE (VOUT > VMAX) Bit 7 = 1 -> MAX CURRENT (IOUT > Absolute Max Iout) Bit 8 = 1 -> TEMPERATURE WARNING (TEMP > 80ºC) Bit 9 = 1 -> OVER TEMPERATURE (TEMP > 125ºC) Bit 10 = 1 -> DISABLED (External Inhibit active) Bit 11 = 1 -> CALIBRATION ERROR Bit 12 = 1 -> Resetting Bit 13 = 1 -> Going Off Bit 14 = 1 -> MAX POWER (OUTPUT POWER > 4W; meaningless for DT5780) Bit 15 = 1 -> FAN SPEED HIGH In case of: DISABLED OVER CURRENT OVER TEMPERATURE MAX POWER Channel is turned off according to Power Down Mode (see CONTROL register) If Monitor Mode (Bit 7 Control Register) = 1, this register is used to read the management firmware release of A639. E.g.: Release Firmware 1:03 (READ: 0x103); Status Word High Byte = 1, Status Word Low Byte = 3

2.8 VMON

Address	0x1n40
Resolution	See below
Description	If Monitor Mode (Bit 7 Control Register) = 0, this register provides the value of the monitored voltage. The value of VMON is equal to the contents of the register multiplied by the resolution of 0.1V. Ex: VMON Reg = 10238 = VMON 1023.8V If Monitor Mode (Bit 7 Control Register) = 1, this register is used to read the value of the voltage between Pin 3 (EXT_ANALOG) and Pin 1 (GND) of the DB9 connector related to the selected channel. The voltage value is equal to the content of the register multiplied by the inverse of the resolution of 0.001V.

2.9 IMON

Address	0x1n44
Resolution	See below
Description	If Monitor Mode (Bit 7 Control Register) = 0, this register provides the monitored current value. The value of Imon is equal to the content of the register multiplied by the resolution (DT5780: 10 nA; DT5790: 50 nA) Ex : Imon Reg = 10238; IMon = 102.38 uA (DT5780) Ex : Imon Reg = 10238; IMon = 511.9 uA (DT5790) If Monitor Mode (Bit 7 Control Register) = 1 this register is used to read the value of the resistance between Pin 8 (EXT_TEMP) and Pin 1 (GND). The resistance value is that of a temperature probe PT100 or PT1000. The resistance value is equal to the contents of the register multiplied by the resolution of 0.1Ohm. E.g.: Imon Reg = 1234 = 123.4 Ohm Resistance