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Find the *Ametek / VTI Instruments / VXI Technology VM3618-S-11175* at our website: *Click HERE*

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REVISIONS

REV	ECN	DESCRIPTION	DATE	APPROVED
A	1262	Release	11/21/01	A.J.G.

Scope: This document is a supplement to the Isolated Digital to Analog Converter Module Model VM3618 User's Manual.

Purpose: To provide information describing the VM3618-S-11175:

Specifications:

Number of Channels:	8 channels	
Voltage Mode:	Output Range	0 – 5V
	Output Current	20 mA max. per channel normal operation 50 mA max. per channel short circuit
	Short Circuit	Continuous duration
	Slew Rate	3V µS (20 mA load)
	Resolution	16 bits, 15 bits monotonic
	Differential ripple and noise	<2mV rms (20Hz-300kHz, 10kΩ load)
Setting Time:		20 µS to 0.1% of specified value
Gain Error:		± 0.015% +0.003%/ °C of setting
Offset Error:		± 2LSB +0.04LSB/ °C
Conversion Rate:		>20,000 changes per second-pseudo register access >300 changes per second-word serial access mode
Isolation:		100V rms, 150 Vdc/ac pk (channel-to-channel or chassis)
Power Requirements:		+5V @ 1.4A, -5.2V @ .10A, +24V @ .70A
Manufacturer's ID		3915
Module Model Code:		285

Note: We do not recommend combining VM3618 modules with VM2XXX series modules within the same VMIP base unit.

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Pin Assignments for Model VM3618-S-11175:

Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
RETURN1	1	NC	12	OUTPUT6	23	DO NOT CONNECT	34
RETURN2	2	NC	13	NC	24	DO NOT CONNECT	35
NC	3	TRIGIN	14	OUTPUT7	25	NC	36
RETURN3	4	GND	15	OUTPUT8	26	DO NOT CONNECT	37
RETURN4	5	OUTPUT1	16	NC	27	DO NOT CONNECT	38
NC	6	OUTPUT2	17	NC	28	NC	39
RETURN5	7	NC	18	NC	29	DO NOT CONNECT	40
RETURN6	8	OUTPUT3	19	GND	30	DO NOT CONNECT	41
NC	9	OUTPUT4	20	DO NOT CONNECT	31	NC	42
RETURN7	10	NC	21	DO NOT CONNECT	32	NC	43
RETURN8	11	OUTPUT5	22	NC	33	GND	44

Programming Functions Not Available for Model VM3618-S-11175:

1. Range
2. Source Current Level
3. VXI *Plug & Play*

Programming Functions Modified for Model VM3618-S-11175:

Source Data

The Source Data command is used to set the output voltage/current level for the specified channels using the 16-bit value that is the equivalent representation of the voltage/current to be configured.

SOURce:DATA <value>, <channel_list>

Where <value> specifies the voltage/current value level as a 16-bit value to be set up for the specified channels.
Where <channel_list> specifies the channels for which the output voltage/current level must be configured. For more details on the syntax of the channel list, see Section 4.

EXAMPLES:

SOUR:DATA 32767, (@1)

Sets the output level for Channel 1.

SOUR:DATA -32768, (@2)

Configures the voltage level for Channel 2 as –32768, which corresponds to 0V.

SOUR:DATA? 2
-32768

Returns the voltage level for Channel 2.

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Source Voltage Level

The Source Voltage Level command sets the output voltage level of the specified channels. This command can be used for only those channels that are operating on the voltage range. If this command is used on channels operating on the current range, an error is generated.

SOURce:VOLTage:LEVel <value>, <channel_list>	*Where <value> specifies the output voltage level that is to be set for the specified channels.* *Where <channel_list>specifies the channels for which the output voltage level is to be configured. It must be ensured that the channels specified in this list are operating on the voltage range otherwise an error will be generated. For more details on the syntax of the channel list, see Section 4.*

EXAMPLES:

SOUR:VOLT:LEV 3, (@1:4)	*Configures the output voltage level for Channels 1 through 4 to 3V.*
SOUR:VOLT:LEV 3.2,(@1)	*Configures the output voltage level for Channel 1 to 3.2 Volts.*
SOUR:VOLT:LEV? 2 3.000000	*Returns the output voltagelevel for Channel 2 as 3 Volts.*

Application Examples

The following example shows how the SCPI commands can be used to set up the trigger parameters of the instrument and to configure the output level of the channels.

TRIG:SOUR EXT	*Configuring the triggering source of the module as EXT, i.e., the front panel input.*
TRIG:SLOP NEG	*Configuring the negative edge of the input trigger to be the triggering edge.*
ROUT:CLOS (@1,2)	*Connecting the outputs of Channels 1 and 2 to their front panel connectors.*
SOUR:VOLT:LEV 3.1,(@1)	*Setting Channel 1's voltage level to 3.1 Volts.*

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Register Access Examples for Model VM3618-S-11175

Note: The VM3618-S-11175 should only be used in pseudo register mode.

This instrument can be programmed through the registers as well as through word serial commands. The programming registers are in the A16 address space. All registers are read/write in the pseudo register mode. Register offsets from the base address are shown in the following table. The base of the registers is set by the logical address of the instrument:

```
BASE_ADDRESS = 49152 + logical_address * 64
```

For example, a logical address of 8 means the base address is 49152 + 8*64 = 49664 (C200 in hex).

To set a value for channel 1, store the 16-bit binary value at offset 20 hex. A value of 123 (007B hex) will cause channel 1 to go to that value on the corresponding DAC.

The full 16-bit value can be used to program the voltage. Here are some examples:

Decimal	Hex	Voltage
0	0	0.000000
1	1	0.000076
16382	3FFE	1.249847
16383	EFFF	1.249924
16384	4000	1.250000
16385	4001	1.250076
32766	7FFE	2.499847
32767	7FFF	2.499924
32768	8000	2.500000
32769	8001	2.500076
49150	BFFE	3.749847
49151	BFFF	3.749924
49152	C000	3.750000
49153	C001	3.750076
65534	FFFE	4.999847
65535	FFFF	4.999924

The type of register access available is called pseudo register access. Pseudo register access has an access time approximately 40µS. With pseudo register access, the module performs the offset and scale associated with the calibration constants. Pseudo register access also allows register read back. The value read back from a register is the value stored in the DAC after the offset and scale operation.

Note: the register access method is selected by the INHOUSE:PSEUDO command and takes effect the next time the module is powered up. (See the following table for the register layout.)

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The Model VM3618 D/A Module supports access to the 8 channels via the Device Dependent Registers of the VXIbus interface. The specific registers are located in A16 Memory at offsets 0x20=Port1, 0x22=Port2, 0x24=Port3, 0x26=Port4, 0x28=Port5, 0x2A=Port6, 0x2C=Port 7 and 0x2E=Port8. The following diagram shows A16 Memory and the Model VM3618 Data Port Map.

TABLE 3-1 A16 MEMORY

Offset	Description
3E	
3C	
3A	
38	
36	
34	
32	
30	
2E	Channel 8
2C	Channel 7
2A	Channel 6
28	Channel 5
26	Channel 4
24	Channel 3
22	Channel 2
20	Channel 1
1E	
1C	
1A	
18	
16	[A32 Pointer Low]
14	[A32 Pointer High]
12	[A24 Pointer Low]
10	[A24 Pointer High]
E	Data Low
C	Data High
A	Response [/Data Extended]
8	Protocol [/Signal] Register
6	[Offset Register]
4	Status / Control Register
2	Device Type
0	ID Register

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Instrument Specific SCPI Commands Not Available for Model VM3618-S-11175:

1. RANGe
2 SOURce:CURRent:LEVel

Instrument Specific SCPI Commands Available for Model VM3618-S-11175:

Command	Description	*RST	Reset Value
CALibration:COUNt	Query the number of times the VM3618 has been calibrated.		N/A
CALibration:GAIN	Set the calibration constant for the gain of the selected channel.	X	Values from nonvol
CALibration:SECure:CODE	Set the code required to disable calibration security.		N/A
CALibration:SECure:STATe	Enable or disable calibration security.	X	1 (security enabled)
CALibration:STORe	Save the current calibration constants into non-volatile memory.		N/A
CALibration:ZERO	Set the calibration constant for the offset of the selected channel.	X	Values from nonvol
MEMory:SETup	Enter a voltage list for manual loading.	X	0
OUTPut:TRIGger:SLOPe	Sets the polarity of the output trigger pulse	X	NEG
OUTPut:TRIGger:TTLTrig	Selects which VXIbus TTL trigger line will output a trigger pulse	X	0
OUTPut:TTLTrig[:STATe	Enables or disables an output trigger pulse to the TTL trigger lines	X	0
ROUTe:CLOSe	Connect one or more channels with their output pins.	X	All channels open
ROUTe:OPEN	Disconnect one or more channels from their output pins.	X	All channels open
SCAN	Enable or disable the operation of the scan list function.	X	Off
SCAN:LIMit	Set the scan loop-back limit.	X	512
SCAN:TABLe	Enter a voltage list on a per channel basis.	X	0
SCAN:TABLe:LOCation	Enter a voltage in a specific location in a list.		N/A
SOURce:DATA	Set the output level of the channels selected by the channel list using the binary data programmed into the 16-bit DAC.	X	0
SOURce:VOLTage:LEVel	Set the output voltage of the channels selected by the channel list.	X	0 volts
SOURce:SETup	Set the output level of all channels using the binary data from a selected location in the scan list.		N/A
TRIGger[:SEQuence][:IMMediate]	Causes a trigger event to occur.		N/A
TRIGger[:SEQuence]:SLOPe	Selects which edge of a triggering signal is the active edge.	X	positive edge
TRIGger[:SEQuence]:SOURce	Selects the trigger event that updates the DACs on the VM3618.	X	AUTO mode

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Instrument Specific SCPI Commands Modified for Model VM3618-S-11175:

SOURce:DATA

Purpose:	Set the output level of the channels selected by the channel list using the binary data programmed into the 16-bit DAC
Type:	Instrument specific SCPI
Command Syntax:	[:][SOURce:] DATA<value>,<channel_list>
Command Parameters:	<value> = -32,768V to +32,767V <channel_list> = 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8
*RST Value:	0
Query Syntax:	[:][SOURce:]DATA?<channel>
Query Parameters:	<channel> = 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8
Query Response:	-32,768 to +32,767
Description:	The Source Data command programs the 16-bit DAC with the binary value specified. For example, a binary value of -32768 would translate into a voltage level of 0 volts. The range for the value parameter is from -32,768 to +32,767. A *RST sets all channels to 0 volts.
Examples:	Command: `data 8191,(@1,2,3)` *Loads channels 1,2 and 3.* Query: `data? 3` Response: `8191` Command: `data 16384,(@7:10)` *Loads channels 7,8, 9 and 10.*
Related Commands:	SOURce:VOLTage:LEVel

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SOURce:VOLTage:LEVel

Purpose:	Set the output voltage level of the channels selected by the channel list
Type:	Instrument specific SCPI
Command Syntax:	[:][SOURce:]VOLTage[:LEVel]<value>,<channel_list>
Command Parameters:	<value> = The range for the value parameter depends on the range selected <channel_list> = 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8
*RST Value:	0
Query Syntax:	[:][SOURce:]VOLTage[:LEVel]?<channel>
Query Parameters:	<channel_list> = 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8
Query Response:	The range for the value parameter depends on the range selected
Description:	The Source Voltage Level command sets the voltage level for the instrument. The voltage input parameter is converted to a 16-bit binary representation used to program the 16-bit DACs. A *RST sets all channels to 0 volt.
Examples:	Command: `volt:lev 3.2,(@1,2,3)` *Loads channels 1,2 and 3.* Query: `volt:lev? 3` Response: `3.200000`
Related Commands:	

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