Institut de RadioAstronomie Millimétrique

VMIVME-4116

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Keywords:

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Change Record

REVISION	DATE	AUTHOR	SECTION/PAGE AFFECTED	REMARKS

Content

1   VME Board VMIVME-4116: 8-channel 16-bit DAC

This board is used for antenna pointing. Located in the pedestal VME crate, it drives Azimuth and Elevation axis.

1.1   Description:

The VMIVME-4116 DAC performs D to A conversion on 16-bit positive true offset binary OR 2's complement coded words, with an analog output range of +/- 10V. This provides a resolution of 305 microVolt for each digital output change of 1 LSB. The buffered output voltage settles to within ½ LSB in 10 microseconds.
The DAC offers one converter per channel. A Control and Status Register (CSR) allows controlling the board. The CSR is readable at any time. Each DAC includes a double-buffered register.

1.2   Data format:

JA, JB: Digital code : JA installed selects offset binary, JB installed selects 2's complement.

	-10.0000V	0.0000V	+9.9997V
2's Complement (JB)	0x8000	0x0000	0x7FFF
Binary Offset (JA)	0x0000	0x8000	0xFFFF

1.3   CSR:

Here is the only control bit used for Plateau de Bure. All other bits have their default startup value.

D14: Setting this bit turns off led "FAIL". Default value is "0" upon startup (Led ON).

1.4   Conversion modes:

The data can be converted in 3 different ways: Each method is enabled/disabled by on-board jumpers and controlled by the CSR
Immediate DAC update mode: DAC channels previously jumpered to use this mode will pass the data written in their first buffer to their second buffer, and immediately update the analog output. This is the default mode with jumpers JD and JE removed. It is also the only mode used on Plateau de Bure.
Delayed DAC update mode: The datas are stored in the first buffers and then transferred into the second buffers, following one of the 2 methods:
    Program control update: setting CSR bit 9 will immediately update all outputs, if jumper JD is installed and JE removed.
    External Trigger update: A low-level pulse on the external trigger input will update all outputs, if jumpers JD and JE are installed.

Jumper JD	Installed	Installed	Removed
Jumper JE	Installed	Removed	Removed
Mode	Delayed update with external trigger	Delayed update with soft trigger	Immediate update

1.5   VME Base Address Jumpers:

S2, S1 Base Address selection, closed switch =0.

S2	S2-1	S2-2	S2-3	S2-4	S2-5	S2-6	S2-7	S2-8
	A15	A14	A13	A12	A11	A10	A9	A8

S1	S1-1	S1-2	S1-3	S1-4
	unused	A7	A6	A5

1.6   VME interface:

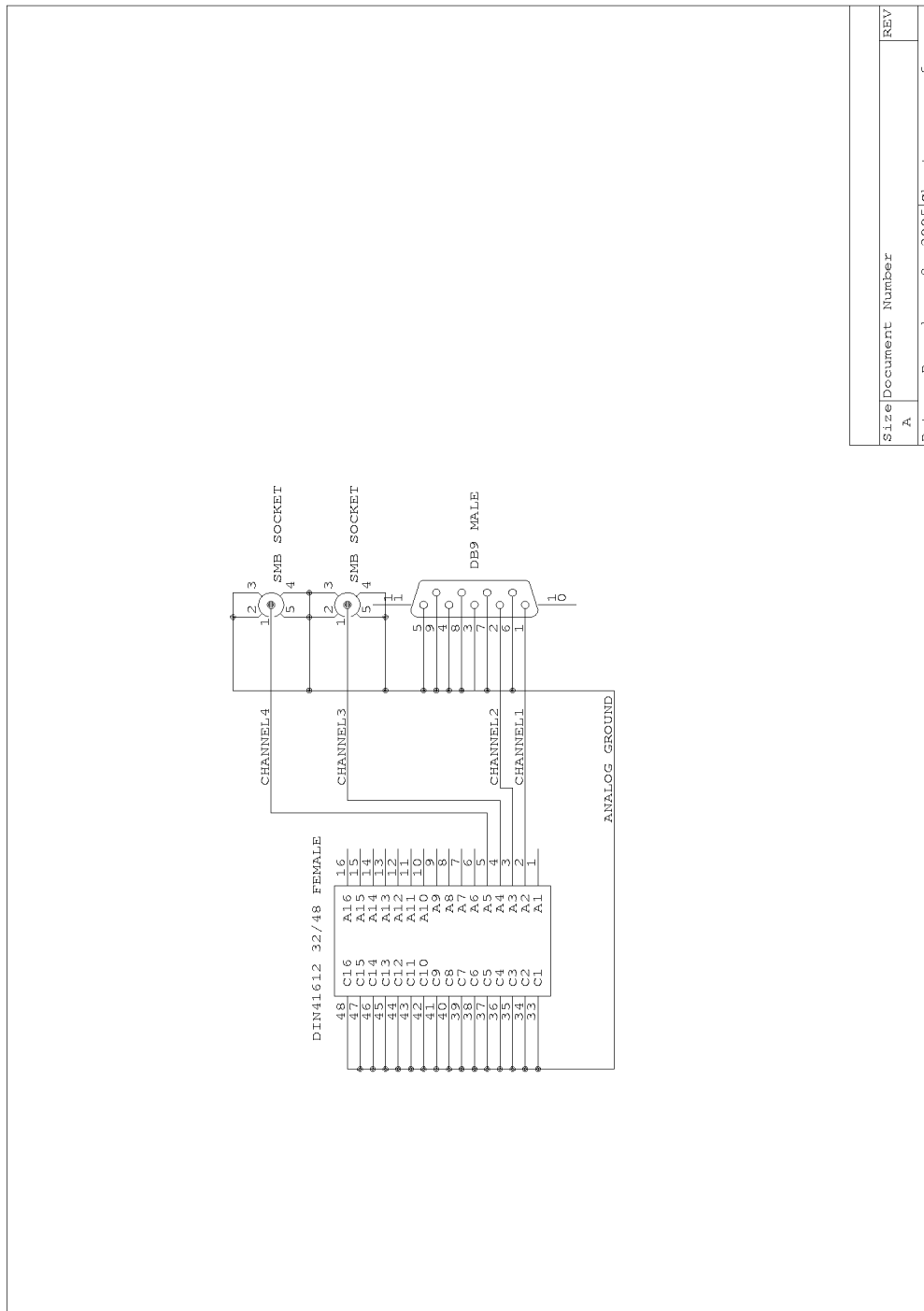| Register	VME Address
CSR	Base + 0x70
DAC OUT 0	Base + 0x60
DAC OUT 1	Base + 0x62
DAC OUT 2	Base + 0x64
DAC OUT 3	Base + 0x66
DAC OUT 4	Base + 0x68
DAC OUT 5	Base + 0x6A
DAC OUT 6	Base + 0x6C
DAC OUT 7	Base + 0x6E

1.7   Output connector P3:

The front-panel output connector is a Panduit 32-pin male 120-332-033A.
The matching female connector is a 120-332-435E.

Pin Number	Row a	Row c
2	Analog Out 0	Analog Ground
3	Analog Out 1	Analog Ground
4	Analog Out 2	Analog Ground
5	Analog Out 3	Analog Ground
6	Analog Out 4	Analog Ground
7	Analog Out 5	Analog Ground
8	Analog Out 6	Analog Ground
9	Analog Out 7	Analog Ground

1.8   IRAM adaptation board:

A small board plugs into the connector P3 for easier connection, through a male DB9 and 2 female SMC connectors. SMC connectors allow the use of coaxial cable.

	Signal	Return
Analog Out 0	SUB D pin 1	SUB D pin 6
Analog Out 1	SUB D pin 2	SUB D pin 7
Analog Out 2	SMC 1 (lower)	SMC 1 shell
Analog Out 3	SMC 2(upper)	SMC 2 shell