



Arb Rider 4022 Digital Option User Guide

Revision	Date	Object	Responsibilities
1.0	15/06/2018		Emitted by:
1.1	27/02/2018	Updated Mini SAS HD to 16 SMA cable name	S.Parma
1.2	15/07/2018	Updated AT-DTTL8 name	Controlled by:
			P.Pellati
			Approved by:

Digital Option User Guide



Arb Rider 4022 Digital Option User Guide

Dear customer,

the purpose of this manual is to describe the digital options, the digital outputs and the accessories related to them.

1.1 DIGITAL OPTIONS

- When you buy the AWG4022-DIG16 or AWG4022-DIG-32 option, you will receive 2 or 4 mini-SAS cable.
Be careful that those cables have the same mechanical dimension of SFF-8644 standard, but the electrical connection is custom, so **it's not possible to use standard mini-SAS cables** otherwise the unit will be **damaged**.

In this user manual the AWG4022-DIG16 option will be called as **DO16**, the AWG4022-DIG-32 option will be called as **DO32**.

- There are also two additional accessories available from Active Technologies to be used with the digital outputs but they are not included in the AWG4022-DIG16 or AWG4022-DIG-32 options:
 - The first accessory available from Active Technologies is the AT-LVDS-SMA8 cable that is a mini-SAS to SMA cable adapter that allows you to connect 8 digital LVDS output by 16 SMA cables (2 SMA per LVDS pair)
 - The second accessory is the AT-DTLL8. This is a probe that can be connected to the mini-SAS cable provided with the dig license and it allows to convert LVDS into LVTTTL standard.

1.2 A. Digital Outputs

The ARB Rider AWG-4022 can output 16-bit or 32-bit of digital patterns with option **DO16** or **DO32**. All bits are differential pairs in LVDS. The digital outputs can be configured as high speed or low speed mode in the Advanced Mode application.

In high speed mode DO32, only Pod A and Pod C are available. The bit rate is half of the sampling rate (for example, 1.25 Gb/s at 2.5 GS/s sampling rate).



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In low speed mode DO32, Pod A, Pod B, Pod C and Pod D are available. The bit rate is a quarter of the sampling rate (for example, 625 Mb/s at 2.5 GS/s sampling rate).

In high speed mode DO16, only Pod A is available. The bit rate is half of the sampling rate (for example, 1.25 Gb/s at 2.5 GS/s sampling rate).

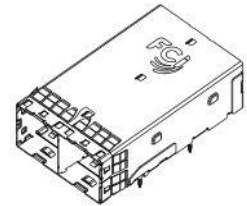
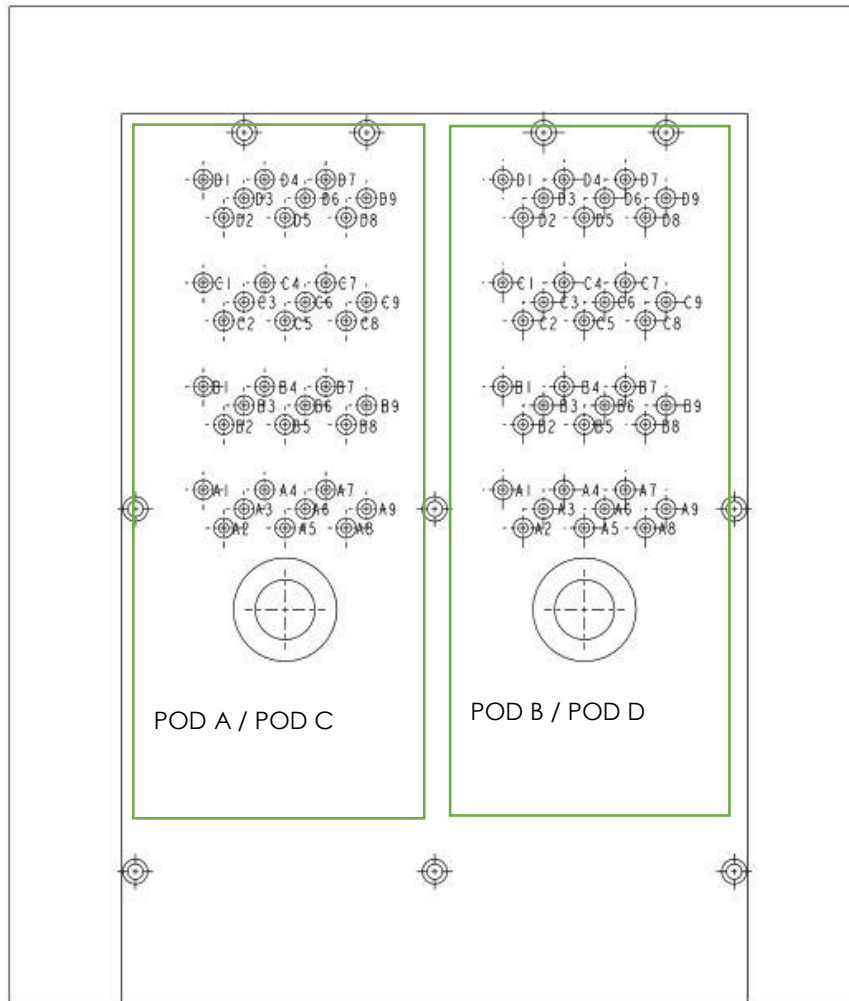
In low speed mode DO16, Pod A, Pod B are available. The bit rate is a quarter of the sampling rate (for example, 625 Mb/s at 2.5 GS/s sampling rate).

The Arb-Rider AWG 4022 has two Mini SAS HD connectors with the following pinout



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PIN OUT DESIGNATIONS



POD A / PODC	Connection	AT-LVDS-SMA8 Mini SAS HD to 16 SMA cable (8 LVDS output)
A1	+12Vcc	NA
A2	+12Vcc	NA
A3	GND	SMA Ground
A4	DO7_P	DO 7_P



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A5	DO7_N	DO 7_P
A6	GND	NA
A7	DO0_P	DO 0_P
A8	DO0_N	DO 0_N
A9	GND	SMA Ground
B1	CS1 (RESERVED)	NA
B2	+12Vcc	NA
B3	GND	SMA Ground
B4	DO6_P	DO 6_P
B5	DO6_N	DO 6_N
B6	GND	SMA Ground
B7	DO1_P	DO 1_P
B8	DO1_N	DO 1_N
B9	GND	SMA Ground
C1	+5Vcc	NA
C2	+5Vcc	NA
C3	GND	SMA Ground
C4	D5_P	DO 5_P
C5	D5_N	DO 5_N
C6	GND	SMA Ground
C7	D2_P	DO 2_P
C8	D2_N	DO 2_N
C9	GND	SMA Ground
D1	SCL	NA
D2	SDA	NA
D3	GND	SMA Ground
D4	D4_P	DO 4_P
D5	D4_N	DO 4_N
D6	GND	SMA Ground
D7	D3_P	DO 3_P
D8	D3_N	DO 3_N
D9	GND	SMA Ground

POD B / POD D	Connection	
A1	+12Vcc	NA
A2	+12Vcc	NA
A3	GND	SMA Ground
A4	DO15_P	DO 7_P
A5	DO15_N	DO 7_P
A6	GND	NA
A7	DO8_P	DO 0_P
A8	DO8_N	DO 0_N
A9	GND	SMA Ground
B1	CS2(RESERVED)	NA
B2	+12Vcc	NA



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B3	GND	SMA Ground
B4	DO14_P	DO 6_P
B5	DO14_N	DO 6_N
B6	GND	SMA Ground
B7	DO9_P	DO 1_P
B8	DO9_N	DO 1_N
B9	GND	SMA Ground
C1	+5Vcc	NA
C2	+5Vcc	NA
C3	GND	SMA Ground
C4	D13_P	DO 5_P
C5	D13_N	DO 5_N
C6	GND	SMA Ground
C7	D10_P	DO 2_P
C8	D10_N	DO 2_N
C9	GND	SMA Ground
D1	SCL	NA
D2	SDA	NA
D3	GND	SMA Ground
D4	D12_P	DO 4_P
D5	D12_N	DO 4_N
D6	GND	SMA Ground
D7	D11_P	DO 3_P
D8	D11_N	DO 3_N
D9	GND	SMA Ground



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1.3 AT-LVDS-SMA8



To ensure the best signal integrity when transmitting such high speed digital signals, a customized digital cable and the corresponding connector Mini SAS HD to 16 SMA connector (Active Technologies item code: AT-LVDS-SMA8) can be bought from Active Technologies.

Output connector	SMA
Output type	LVDS
Number of SMA	16 (8 bits)
Cable type	Proprietary standard
Cable Length	1 meter



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1.4 B. AT-DTLL8 - 8 bit LVDS to LVTTL converter for Rider series



Active Technologies developed an 8 bit LVDS to LVTTL converter (Active Technologies item code: AT-DTLL8) that can be used to convert LVDS differential signals to LVTTL single ended signals with a software programmable voltage level from 0.8V to 3.8V.

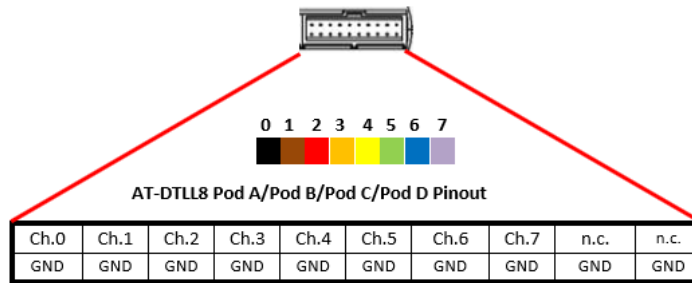
The AT-DTLL8 probe bit rate is 125 Mbps@0.8V and 400 Mbps@3.6V.

Important Note: when the customer will buy the digital option, the cable to connect the AT-DTLL8 probe with the equipment will be provided in the package.

The 8 bit LVDS to LVTTL converter can be bought as an additional accessory.



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Output connector	20 position 2.54 mm 2 Row IDC Header
Output type	LVTTTL
Output impedance	50 Ω nominal
Output voltage	0.8V to 3.8V programmable in group of 16 bits
Maximum Update Rate	125 Mbps@0.8V and 400 Mbps@3.6V
Dimensions	W 52 mm – H 22 mm – D 76 mm
Input Connector	Proprietary standard
Cable Length	1 meter
Cable Type	Proprietary standard