

# Model 676 Digital Option User Guide v.1



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 Model 676-DIG16 or Model 676-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 is not possible to use standard mini-SAS cables** otherwise the unit will be **damaged**.

In this user manual the Model 676-DIG16 option will be referred to as **DO16**, the Model 676-DIG-32 option will be referred to as **DO32**.

- There are also two additional accessories available from Berkeley Nucleonics to be used with the digital outputs but they are not included in the Model 676-DIG16 or Model 676-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 you to convert LVDS into LVTTTL standard.

## 1.2 A. Digital Outputs

The ARB Rider Model 676 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).



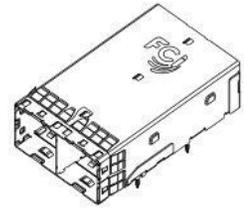
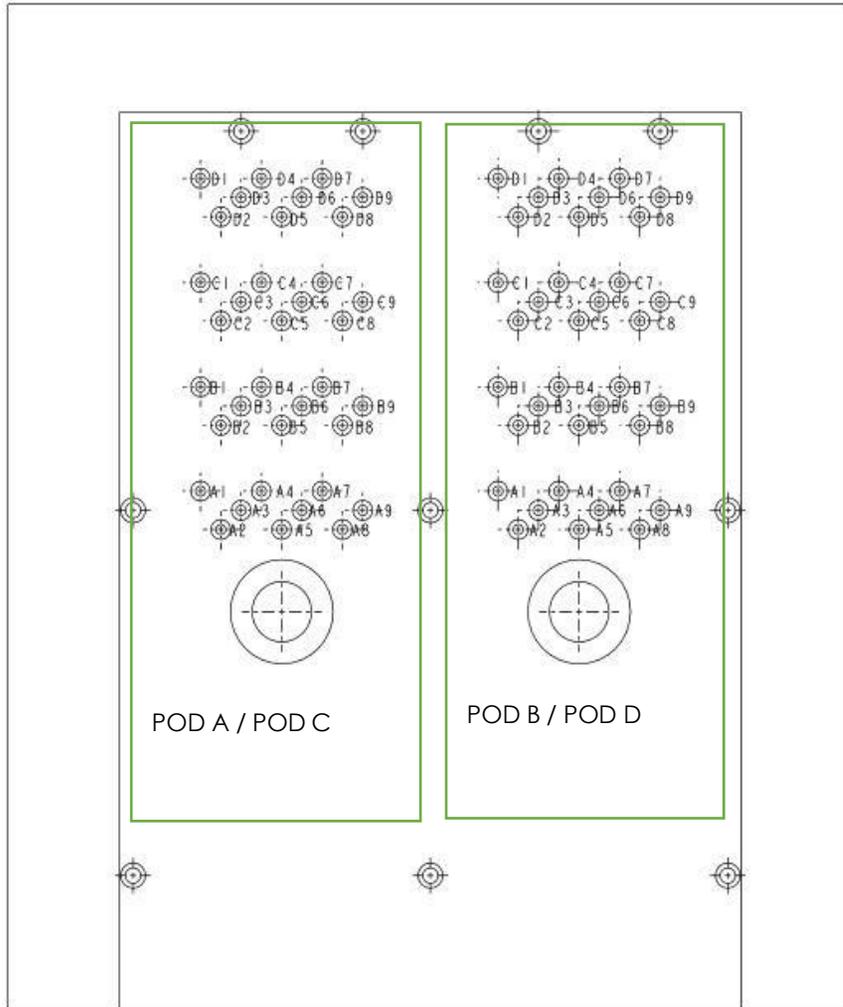
In low speed mode DO32, Pod A, Pod B, Pod C, and Pod D are available. The bit rate is a quarter of the sampling rate (for example, 625 Mb/s at 2.5 GS/s sampling rate).

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, and 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 Model 676 has two Mini SAS HD connectors with the following pinout.

## 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	RX1+

A5	DO7_N	RX1-
A6	GND	NA
A7	DO0_P	RX3+
A8	DO0_N	RX3-
A9	GND	SMA Ground
B1	CS1 (RESERVED)	NA
B2	+12Vcc	NA
B3	GND	SMA Ground
B4	DO6_P	RX0+
B5	DO6_N	RX0-
B6	GND	SMA Ground
B7	DO1_P	RX2+
B8	DO1_N	RX2-
B9	GND	SMA Ground
C1	+5Vcc	NA
C2	+5Vcc	NA
C3	GND	SMA Ground
C4	D5_P	TX1+
C5	D5_N	TX1-
C6	GND	SMA Ground
C7	D2_P	TX3+
C8	D2_N	TX3-
C9	GND	SMA Ground
D1	SCL	NA
D2	SDA	NA
D3	GND	SMA Ground
D4	D4_P	TX0+
D5	D4_N	TX0-
D6	GND	SMA Ground
D7	D3_P	TX2+
D8	D3_N	TX2-
D9	GND	SMA Ground

<b>POD B / POD D</b>	<b>Connection</b>	
A1	+12Vcc	NA
A2	+12Vcc	NA
A3	GND	SMA Ground
A4	DO15_P	RX1+
A5	DO15_N	RX1-
A6	GND	SMA Ground
A7	DO8_P	RX3+
A8	DO8_N	RX3-
A9	GND	SMA Ground
B1	CS2(RESERVED)	NA
B2	+12Vcc	NA

B3	GND	SMA Ground
B4	DO14_P	RX0+
B5	DO14_N	RX0-
B6	GND	SMA Ground
B7	DO9_P	RX2+
B8	DO9_N	RX2-
B9	GND	SMA Ground
C1	+5Vcc	NA
C2	+5Vcc	NA
C3	GND	SMA Ground
C4	D13_P	TX1+
C5	D13_N	TX1-
C6	GND	SMA Ground
C7	D10_P	TX3+
C8	D10_N	TX3-
C9	GND	SMA Ground
D1	SCL	NA
D2	SDA	NA
D3	GND	SMA Ground
D4	D12_P	TX0+
D5	D12_N	TX0-
D6	GND	SMA Ground
D7	D11_P	TX2+
D8	D11_N	TX2-
D9	GND	SMA Ground

### 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 can be bought from the factory.

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

#### 1.4 B. AT-DLL8 - 8-bit LVDS to LVTTL converter for the Model 676 and 675

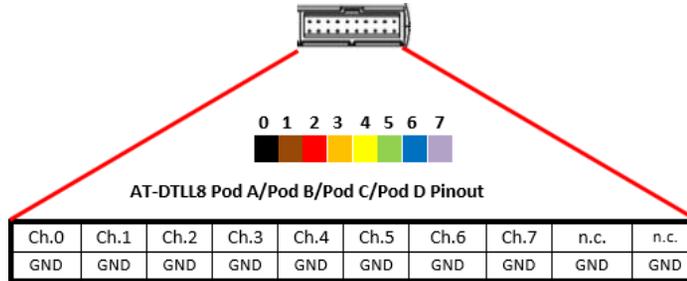


An 8-bit LVDS to LVTTL converter has been developed and can be used to convert LVDS differential signals to LVTTL single ended signals with a software programmable voltage level from 0.8V to 3.8V.

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.



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