Optical Switch Driving Circuit Board, Firmware, and GUI

(Protected by U.S. patent 6823102 and pending patents)

DATASHEET

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The SW-DR-2 kit provides a convenient and cost-effective way to evaluate Agiltron's switches of CrystaLatch™ (CL), LightBend™ (LB), MEMS, and Fiber-Fiber™ (FF) optical switches up to 15 activation points. It comprises a main control board, a switch mounting daughter board, GUI, a power supply, and a computer interface cable. Switching driving logic is burn-in. The evaluation board integrates RS232 or USB and TTL interfaces. The selection is via an onboard jumping plug.

This board can control multiple switches simultaneously and is designed to be flexible to meet application scenarios. Compatibility with various switch configurations is realized via an application-specific switch mounting daughter board, in which fibers are connected by splicing if cascading is required. A user-specific GUI Windows™ program is provided (in a stick inside the box).

Features

- USB, RS232, & TTL
- Flexible configuration
- User-friendly GUI

Specifications

Parameter	Min	Normal	Max	Unit
Control Channels	1		8	
Output Switching Voltage [1]	4.75	5	5.25	V
Switching Current [2]			2.0	A
Output Pulse Width [3]	0.1		3.0	ms
Power Supply Voltage [4]	11.7	12	12.3*	V
Power Consumption (No Switching) [5]			0.25	W
USB/RS232 [6]				V
TTL Interface [7]	TTL Logic L<0.8V H>3.5V			
Electrical Connector Type	Male AMP 103309-2 or equivalent			
Board Dimension	(L)100mm x (W)60mm x (H)15mm			

Notes:

[1]. Pulse width output, through J3
[2]. Total switching current, continuous
[3]. Pulse duration adjustable by firmware
[4]. Input power supply through J2
[5]. Hot pluggable. <1.5A inrush current
[6]. Using J7 to select USB or RS232
[7]. Through J4

*** Over this value will damage the device**

Compatibility

- NxM CrystaLatch™ Switches (N=1,2 M□8; N=4, M=4)
- NxM LightBend™ Switches (N=1,2 M□8; N=4, M=4)
- Multi-functional electronic control

Note: Each SW-DR-2 is designed to mount a specific Agiltron switch at the company. They are not made for customers to install at the customer site due to the complexity and the amount of support required.

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Control Modes

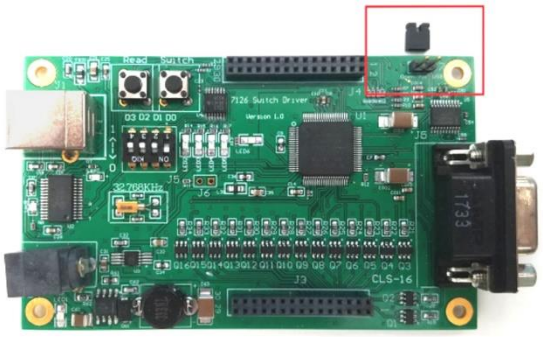
USB Control	This is a default setting for use with the supplied GUI Windows™-compatible software for programmable switching testing.
RS232 Control	This function needs to jump the two pins of J7 to close position. The black jump is provided on the J7. This communication port has 9600; data bits: 8; parity: none; stop bits: 1; flow control: none;
TTL Control	This function always works. Standard TTL logic level with TTL logic timing. A TTL emulator is available on the circuit board.

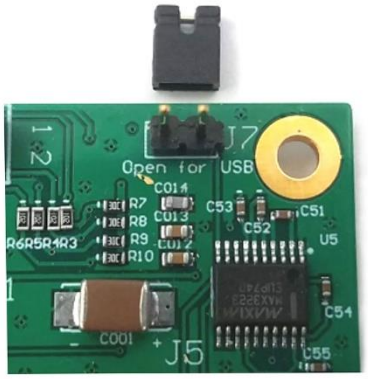
Warning: Control Signal >5.5V Will Damage the Board

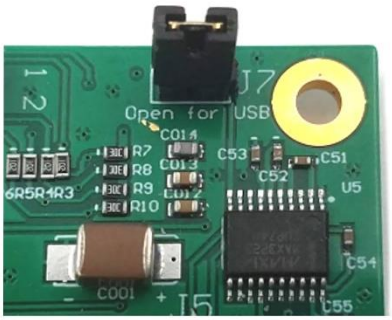
Warning: The unit is ESD sensitive, do not touch the PCB

Changing from USB to RS232

Use the J7 connector (provided with switch) to choose USB or RS232.







Changing from USB to RS232

1. Plug in the accompanied power supply.
2. Load the accompanied GUI into a computer
3. Connect the computer to the board using the accompanied cable
4. Run the software
5. Do not change any hardware setting that requires costly rest at the company

Power Consumption

Static Condition – 12V/12mA

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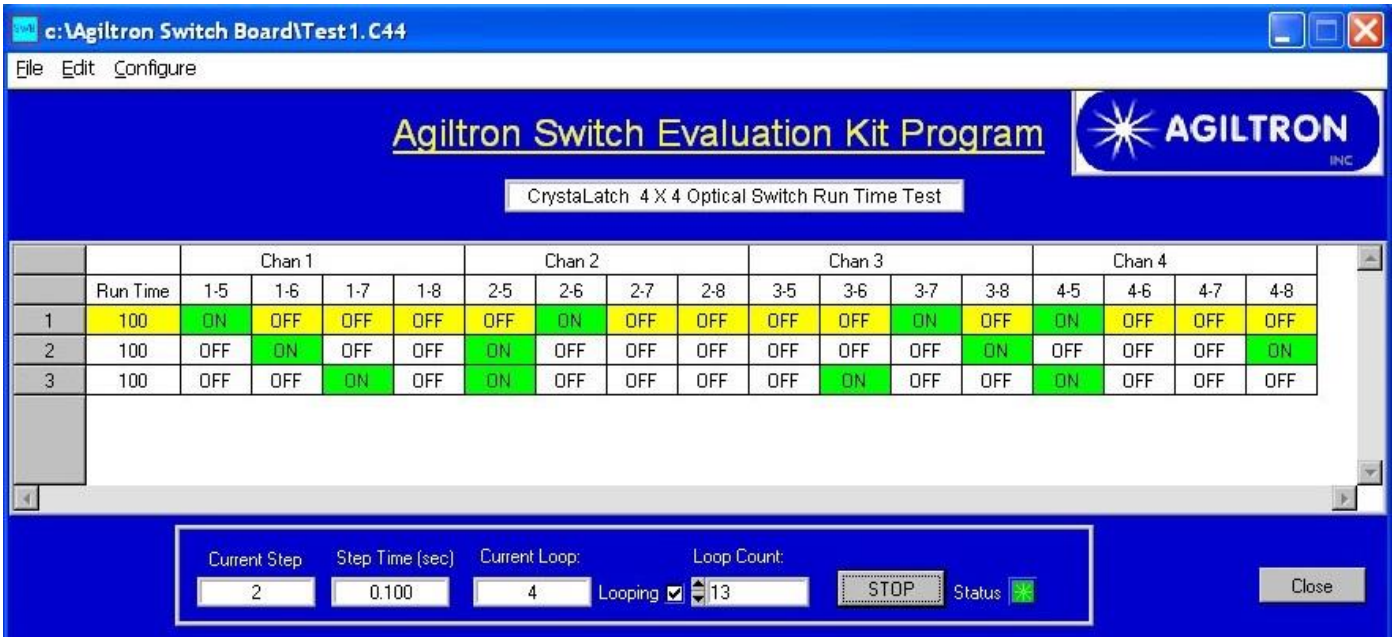
GUI Example (4x4)



Command List

Table 1: RS232 Command/Response Format

Command:	<Addr>	<Code>	<Dx>	<Dy>
Response:	<Addr>	<Code>	<Dx>	<Dy>

<Addr>	Module Address: 0 for all modules and 1-255 for specified module. Default:1
<Code>	Control Code: Refer to Command Code Table
<Dx>	One byte data, high byte
<Dy>	One byte data, low byte

Table 2: RS232 Command Code Table

Description			
Read Module Address	Address = <Dx> <Dy>		
Set Module Address	<Dx> <Dy> = 1 ~ 255		
Read Module Serial Number (Higher 2 Bytes)	S/N (Higher 2 Bytes) = <Dx> <Dy>		
Read Module Serial Number (Lower 2 Bytes)	S/N (Lower 2 Bytes) = <Dx> <Dy>		
Read Module Type	Type = <Dx> <Dy> (m ´ n switch: n ¾ first two digits from left; m ¾ third and fourth digit from left)		
Read Module Version	Hardware Version = <Dx> / 10; Firmware Version = <Dy> / 10		
Read Switch Status	N = <Dx><Dy> ($D_4D_3D_2D_1D_0$ = N-1)		
Set Switch to Status N (N = $D_4D_3D_2D_1D_0$+1, 1£N<£32)	<Dx><Dy> = N		
Read Individual Switch Status	Status = <Dx><Dy>.	Bit-M: 0 ¾ Switch (M+1) L Position; 1 ¾ Switch (M+1) U Position;	
Set Individual Switch Positions	<Dx><Dy>	Bit-M: 0 ¾ Switch (M+1) L Position; 1 ¾ Switch (M+1) U Position;	
Read Module Alarm	Normal: <Dx> <Dy> = 0	Temperature Alarm: [Bit-0 of <Dx> <Dy>] = 1	Power Supply Alarm: [Bit-1 of <Dx> <Dy>] = 1
Read Module Temperature	T(°C) = <Dx> <Dy> / 10		
Read Power Supply Voltage	V(mV) = <Dx> <Dy>		
Read Low Temperature Alarm Threshold	T(°C) = <Dx> <Dy> / 10		
Set Low Temperature Alarm Threshold	<Dx> <Dy> = 10 ´ T(°C)		
Read High Temperature Alarm Threshold	T(°C) = <Dx> <Dy> / 10		
Set High Temperature Alarm Threshold	<Dx> <Dy> = 10 ´ T(°C)		

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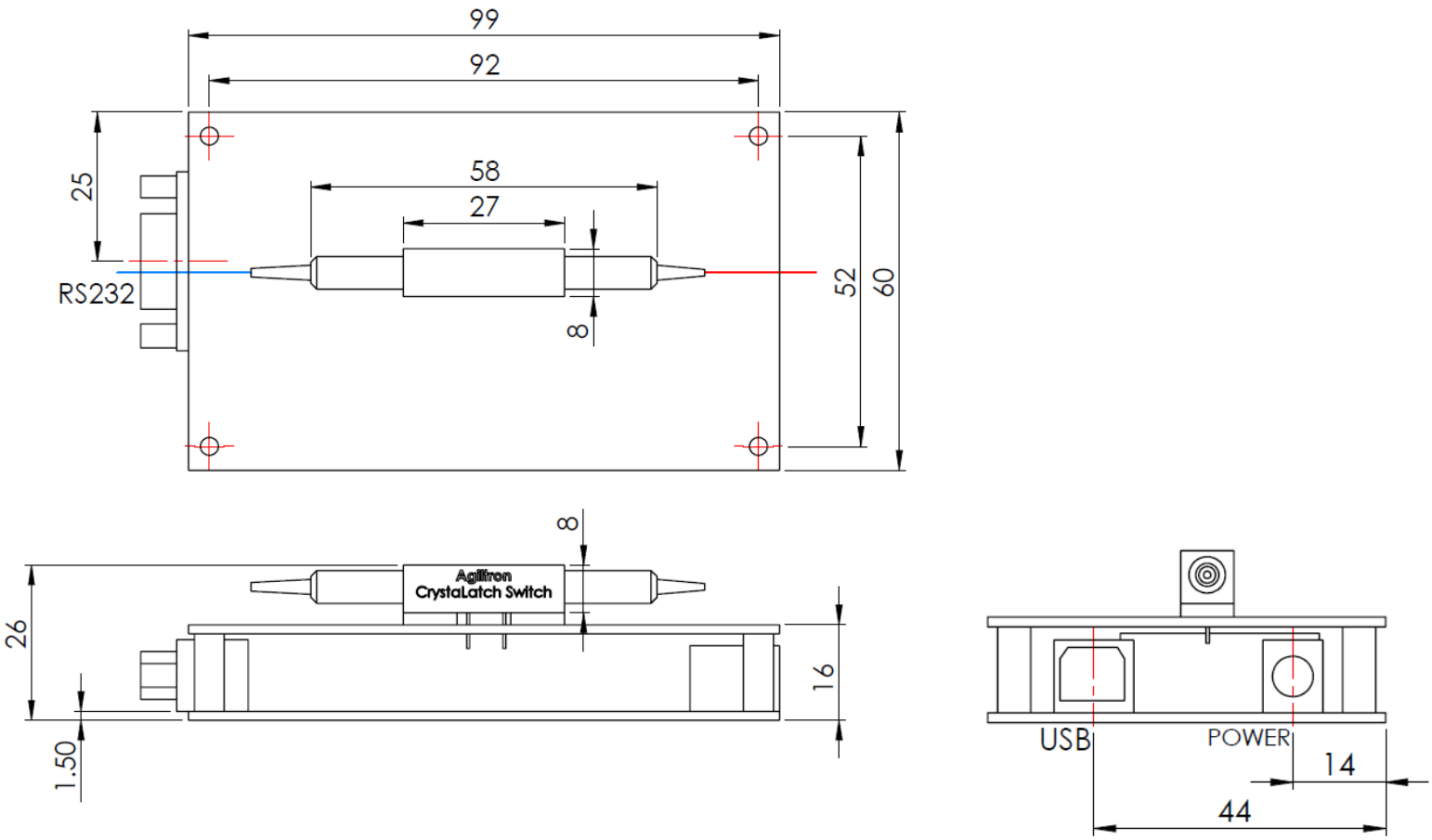
Mechanical Dimensions



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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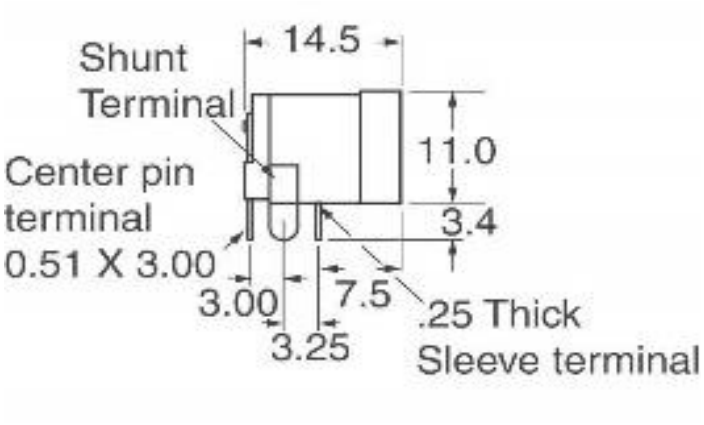
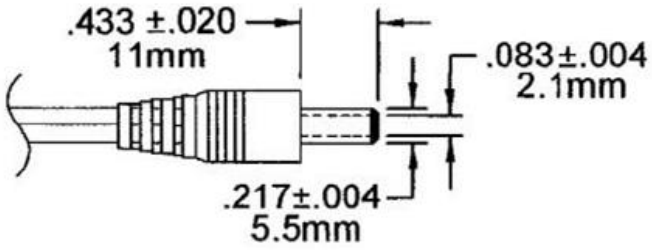
Power Connector

P/N:
Power Barrel Connector Jack 2.00mm ID (0.079"), 5.50mm OD (0.217") Through Hole, Right Angle



12V Wall Plug DC Power Supply Interface



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Ordering Information

	☐	☐☐	☐	☐	☐	☐	☐	☐
Prefix	**Switch Type**	**Function**	**Latching**	**Repeat Rate [1]**	**Footprint**	**# of Switch[2]**	**Control Mode**	**DC supply**
SWDR-	FF switch = 1 CL switch = 2 LB switch = 3 MEMS switch = 4 Delayline LB = 6 Delayline CL = 7 Delayline MEMS = 8	1x1 = 1a 1x2 = 2a 2x1 = 2b 2x2 = 2c 1x4 = 4a 4x1 = 4b ... 1x9 = 9a 9x1 = 9b 9x9 = 9c 1x10 = 10 ... 1x99 = 99 Special = 00	Latching = 1 Non-latching = 2	2Hz = 4 5Hz = 5 20Hz = 1 2kHz (CL) = 2	Standard = 1 Octo switch = 2 Special = 0	1 switch = 1 2 switches = 2 3 switches = 3 N switches = N Special = 0	TTL = 1 USB = 2 RS232 = 3 Special = 0	12VDC = 1 Special = 0

[1]: LB, MEMS,FF all limited to 2Hz. 2KHz requires Windows 10 computer.

[2]: Up to 16 1x2/2x2 switches. Optically connecting these switches via splicing is available

Note:

- ❑ This driver is intended mounted with specific switches, tuned, and tested prior to shipping. It is not designed to be sold separately.

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Application Notes

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

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