HARDWARE MANUAL

Revision 4.3

TITAN-SVX-CR

SERVO MOTOR CONTROLLER-DRIVER MODULE with
2NDSIGHT MOTION LEARNING TECHNOLOGY

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1. Introduction

The TITAN-SVX-CR is an advanced single-axis closed loop servo driver-controller module that supports various types of motors that are commonly used in the automation industry:

- 2 Phase Stepper Motor
- 3 Phase Brushless Rotary Servo Motor
- 3 Phase Brushless Linear Servo Motor
- DC Voice Coil Motor

The module package allows the TITAN-SVX-CR to be conveniently and seamlessly integrated into an application.

In addition to the advanced servo motion control technology, the TITAN-SVX-CR also has a new patent-pending 2ndSIGHT Motion Learning Technology that uses multi-dimensional characterization modeling of the motion system along with various statistical algorithms and methods in monitoring and determining the real-time “health” or condition of the motion system. 2ndSight determines the deviations, trends, creep, degradation and various other trends of the motion system on the TITAN controller (edge analysis) so that intelligent decision and preventative actions can be planned and performed by the master system before potential failure occurs.

TITAN-SVX-CR is a true intelligent motion controller driver that enables and readies the future in the field of Smart Factory and Automation and Industrial Internet of Things.

1.1. Technical Features

- Communication using UART
  - 115200 bps, 8N1

- Communication Protocol supported:
  - TITAN-ASCII
  - TITAN-ASCII with CRC
  - MODBUS-ASCII
  - MODBUS-RTU

- Standalone programmable using Arcus A-SCRIPT language with support of 3 multi-thread programs

- Closed Loop Driver Specifications:
  - 24-48 VDC
  - 4.0 Amp max peak current setting
  - 1 MHz max pulse support (in Pulse Mode)

- Multiple types of motor support:
  - 2 Phase Bipolar Stepper Motors
  - 3 Phase Brushless Rotary Servo Motors
  - 3 Phase Brushless Linear Servo Motors
  - DC Voice Coil Motors

- Configurable in following modes:
  - Pulse Mode - digital pulse control using pulse/dir or CW/CCW
  - Control Mode – internal motion profile generation with motion sequence control from internal standalone programming.

- Opto-isolated Digital IO:
  - 8 bits of digital inputs
  - 3 bits of digital outputs

- A/B/Z differential encoder inputs with A/B/Z single ended encoder signal outputs

- UVW Hall sensor digital inputs

- Control Mode Features:
  - Homing routines using combination of Home/Limit/Z Index
  - Soft and Hard Limit Protection.
  - Over-current/Over-voltage/ Under voltage/Temperature/Position Error fault detection

2. Electrical and Thermal Specifications

Parameter	Min	Max	Units
Control Power Input (V_{DD})	+4.0	+5.5	V
	-	500	mA
DrivePower Input[1]	+24	+48	V
	-	4	A
Digital Inputs	-0.3	V_{DD}	V
Digital Input High Voltage	V_{DD} – 0.6	V_{DD}	V
Digital Input Low Voltage	0	0.6	V
Digital Outputs	0	V_{DD}	V
Digital Output High Voltage	V_{DD} - 0.6	V_{DD}	V
Digital Output Low Voltage	0	0.6	V
Operating Temperature[2]	-20	+80	°C
Storage Temperature[2]	-55	+150	°C

Table 2.0

[1]The supply current should match the driver current setting.
[2]Based on component ratings

3. Dimensions

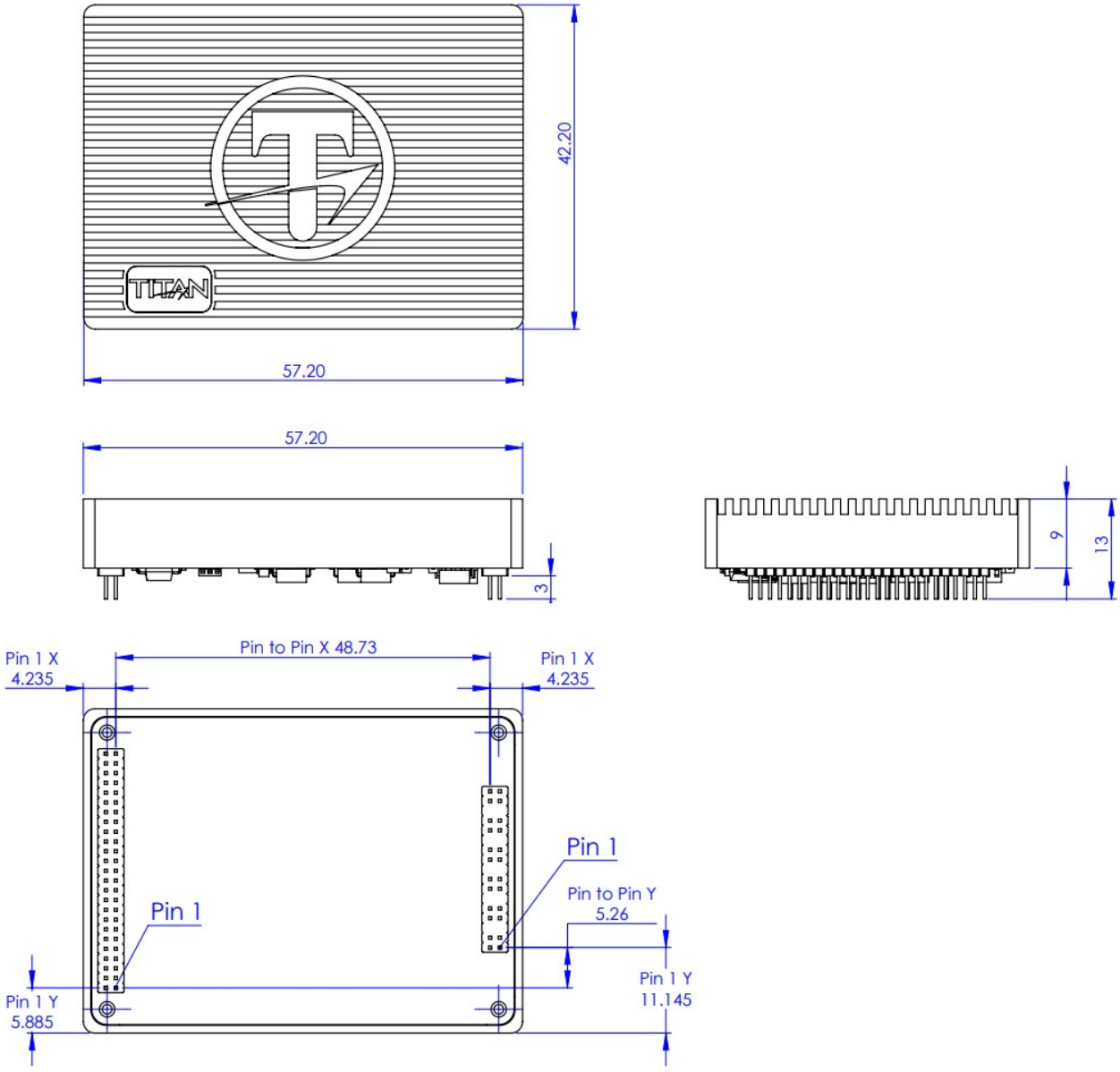

Figure 3.0

4. Connectivity

4.1. 50-Pin I/O Connector

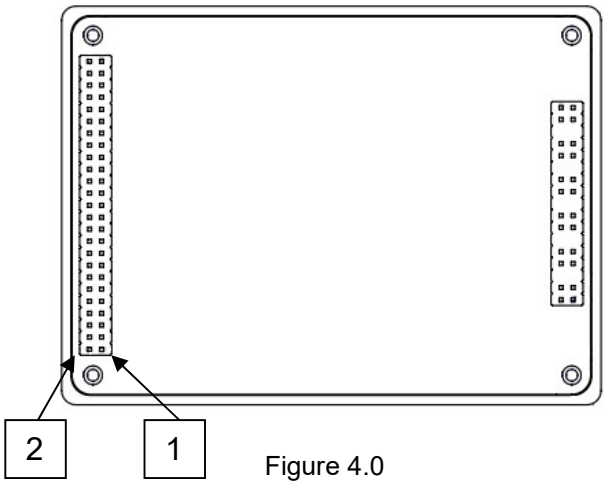

Figure 4.0

Pin #	In/Out	Name	Description
1	I	+5V	+5VDC
2	I	+5V	+5VDC
3	I	DI1/PUL	Digital input 1 / Pulse input
4	I	DI2/DIR	Digital input 2 / Direction input
5	I	DI3/ENA	Digital input 3 / Enable input
6	O	DO1/ALM	Digital output 1 / Alarm output
7	I	DI4/CLR	Digital input 4 / Clear input
8	O	DO3/INP	Digital output 3 / In Position output
9	O	DO2	Digital output 2
10	I	DI5/RST	Digital input 5 / Reset input
11	I	DI7	Digital input 6
12	I	DI6	Digital input 5
13	O	LED1	LED 1
14	I	DI8	Digital input 8
15	O	LED3	LED 3
16	O	LED2	LED 2
17	I	GND	Ground
18	NC	NC	No connection
19	I	GND	Ground
20	NC	NC	No connection
21	NC	NC	No connection
22	NC	NC	No connection
23	NC	NC	No connection
24	NC	NC	No connection
25	NC	NC	No connection

26	NC	NC	No connection
27	NC	NC	No connection
28	NC	NC	No connection
29	NC	NC	No connection
30	NC	NC	No connection
31	NC	NC	No connection
32	NC	NC	No connection
33	NC	NC	No connection
34	NC	NC	No connection
35	O	REDE1	REDE signal [UART1]
36	O	REDE2	REDE signal [UART2]
37	O	TXD1	Transmit signal [UART1]
38	O	TXD2	Transmit signal [UART2]
39	I	RXD1	Receive signal [UART1]
40	I	RXD2	Receive signal [UART2]
41	I	HU	U hall sensor input
42	I	EA	A encoder input
43	I	HV	V hall sensor input
44	I	EB	B encoder input
45	I	HW	W hall sensor input
46	I	EZ	Z encoder input
47	NC	NC	No connection
48	I	AI1	Analog input 1
49	I	GND	Ground
50	I	GND	Ground

Table 4.0

Mating Connector Description: 50-pin Dual Row Receptacle
Mating Connector Manufacturer: Amphenol FCI
Mating Connector Manufacturer Part: †20021311-00050T4LF

† Other compatible connectors can be used.

4.2. 34-Pin Motor Connector

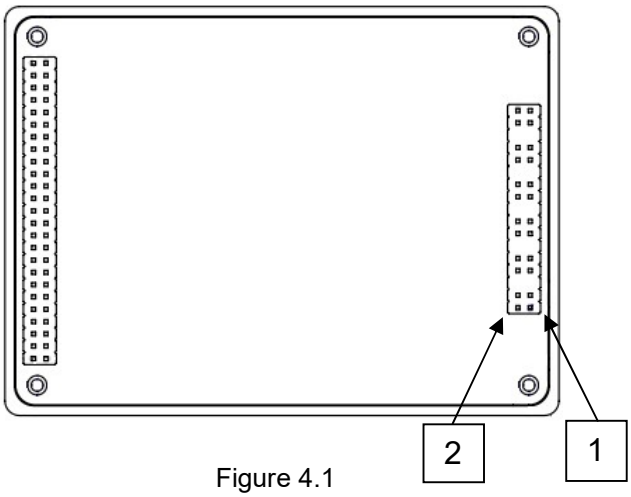

Figure 4.1

Depending on the type of motor, follow the motor connection as shown below.

3 Phase BLDC/PMSM Motor (Rotary and Linear)		
Pin #	**Name**	**Description**
1	PWR	+24VDC to +48VDC
2	PWR	+24VDC to +48VDC
3	PWR	+24VDC to +48VDC
4	PWR	+24VDC to +48VDC
5	NC	No connection
6	NC	No connection
7	V	Motor V
8	V	Motor V
9	V	Motor V
10	V	Motor V
11	NC	No connection
12	NC	No connection
13	U	Motor U
14	U	Motor U
15	U	Motor U
16	U	Motor U
17	NC	No connection
18	NC	No connection
19	W	Motor W
20	W	Motor W
21	W	Motor W

22	W	Motor W
23	NC	No connection
24	NC	No connection
25	NC	No connection
26	NC	No connection
27	NC	No connection
28	NC	No connection
29	NC	No connection
30	NC	No connection
31	GND	Ground
32	GND	Ground
33	GND	Ground
34	GND	Ground

Voice Coil		
Pin #	**Name**	**Description**
1	PWR	+24VDC to +48VDC
2	PWR	+24VDC to +48VDC
3	PWR	+24VDC to +48VDC
4	PWR	+24VDC to +48VDC
5	NC	No connection
6	NC	No connection
7	+	Motor +
8	+	Motor +
9	+	Motor +
10	+	Motor +
11	NC	No connection
12	NC	No connection
13	-	Motor -
14	-	Motor -
15	-	Motor -
16	-	Motor -
17	NC	No connection
18	NC	No connection
19	NC	No connection
20	NC	No connection
21	NC	No connection
22	NC	No connection
23	NC	No connection

24	NC	No connection
25	NC	No connection
26	NC	No connection
27	NC	No connection
28	NC	No connection
29	NC	No connection
30	NC	No connection
31	GND	Ground
32	GND	Ground
33	GND	Ground
34	GND	Ground

2 Phase Bi-Polar Stepper Motor		
Pin #	**Name**	**Description**
1	PWR	+24VDC to +48VDC
2	PWR	+24VDC to +48VDC
3	PWR	+24VDC to +48VDC
4	PWR	+24VDC to +48VDC
5	NC	No connection
6	NC	No connection
7	A	Motor A
8	A	Motor A
9	A	Motor A
10	A	Motor A
11	NC	No connection
12	NC	No connection
13	B	Motor B
14	B	Motor B
15	B	Motor B
16	B	Motor B
17	NC	No connection
18	NC	No connection
19	/A	Motor /A
20	/A	Motor /A
21	/A	Motor /A
22	/A	Motor /A
23	NC	No connection
24	NC	No connection
25	/B	Motor /B

26	/B	Motor /B
27	/B	Motor /B
28	/B	Motor /B
29	NC	No connection
30	NC	No connection
31	GND	Ground
32	GND	Ground
33	GND	Ground
34	GND	Ground

Table 4.1

Mating Connector Description: 34-pin Dual Row Receptacle
Mating Connector Manufacturer: Amphenol FCI
Mating Connector Manufacturer Part: †20021311-00034T4LF

† Other compatible connectors can be used.

Important Note

Do **NOT** disconnect the motor wires or motor connector while the motor is servoing on or when motor is moving.

Make sure to turn off the power to the controller or make sure that the motor is disabled when disconnecting the motor from the driver.

Plugging or unplugging the motor while the servo is on may damage the motor and/or the electronics.

Contact Information

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The information in this document is believed to be accurate at the time of publication but is subject to change without notice.