APPLICATION		REVISION			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED

TURBINE DIAGNOSTIC SERVICES, INC
13447 BYRD DR
ODESSA, FL 33556

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TITLE

COMPONENT DESCRIPTION, 16 CHANNEL CONTACT INPUT MODULE, T1K-16ND3

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96401	-

SCALE: NONE

Table of Contents

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96401	-
SCALE: NONE		SHEET 2 OF 6	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 16 Channel Contact Input module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

This document is intended to describe to individuals interested in the component, a broad knowledge of the component, its capabilities, its architecture, and where to locate additional detailed information.

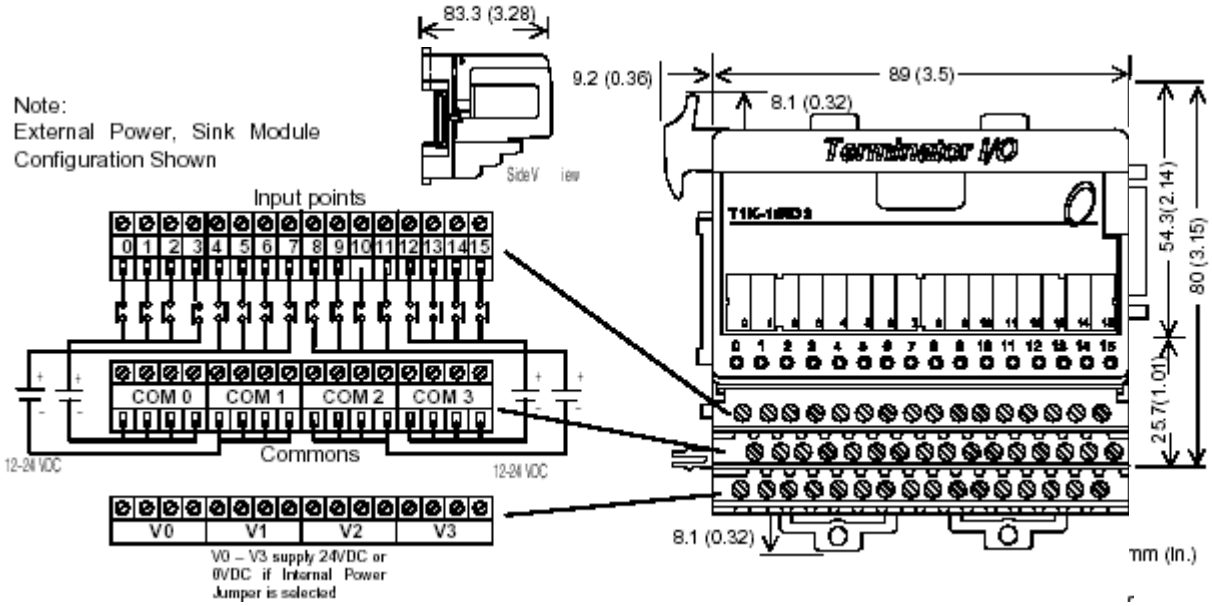
2.0 Component Description

2.1 Specifications

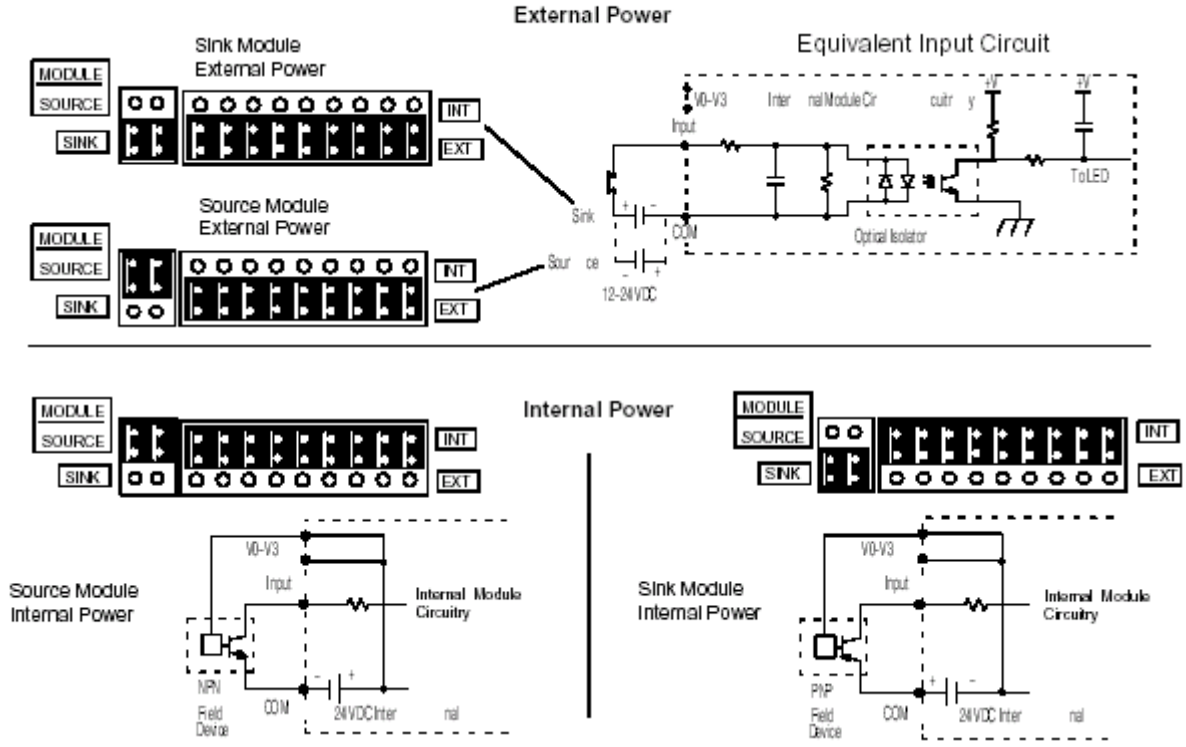
T1K-16ND3 Contact Input Module	
Inputs per module	16 (sink/source)
Commons per module	ext. power: 4, isolated (4 pts. / com) int. power: 4, all 16 pts, internally connected
Operating Voltage	12-24 VDC
Input Voltage Range	10.8 – 26.4 min. / max.
Peak Voltage	30 VDC
Input Current (Typical)	4mA @ 12 VDC, 8.5mA @ 24 VDC
Input Impedance	2.8 KΩ
ON Voltage Level	> 10.0 VDC
OFF Voltage Level	< 2.0 VDC
Min. ON Current	4mA
Max. OFF Current	0.5mA
OFF to ON Response	2-8ms, Typ: 4ms
ON to OFF Response	2-8ms, Typ: 4ms
Base Power Required	70mA @ 5VDC
Status Indicators	Logic Side
Weight	120g

Environmental Specifications	
Ambient Operating Temperature	32°F to 131°F (0°C to 55°C)
Storage Temperature	-4°F to 158°F (-20°C to 70°C)
Ambient Humidity	5% to 95% (Non-condensing)
Atmosphere	No corrosive gasses. The level of environmental pollution = 2 (UL 840)
Vibration Resistance	MIL STD 810C, Method 514.2
Shock Resistance	MIL STD 810C, Method 516.2
Voltage Withstand	1500VAC, 1 minute
Insulation Resistance	500VDC, 10MΩ
Noise Immunity	NEMA ICS3-304 Impulse Noise 1μs, 1000V FCC class A RFI (144MHz, 430MHz 10W, 10cm)
Agency Approvals	UL, CE, FCC class A

2.2 Wiring & Dimensions



2.3 Module Jumper Settings



SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96401	-
SCALE: NONE		SHEET 5 OF 6	

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SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96401	-
SCALE: NONE		SHEET 6 OF 6	

APPLICATION		REVISION			
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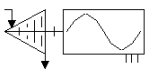

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TITLE

COMPONENT DESCRIPTION, 8 CHANNEL CONTACT OUTPUT MODULE, T1K-8TD1

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96402	-

SCALE: NONE

Table of Contents

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96402	-
SCALE: NONE		SHEET 2 OF 6	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 8 Channel Contact Output module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

This document is intended to describe to individuals interested in the component, a broad knowledge of the component, its capabilities, its architecture, and where to locate additional detailed information.

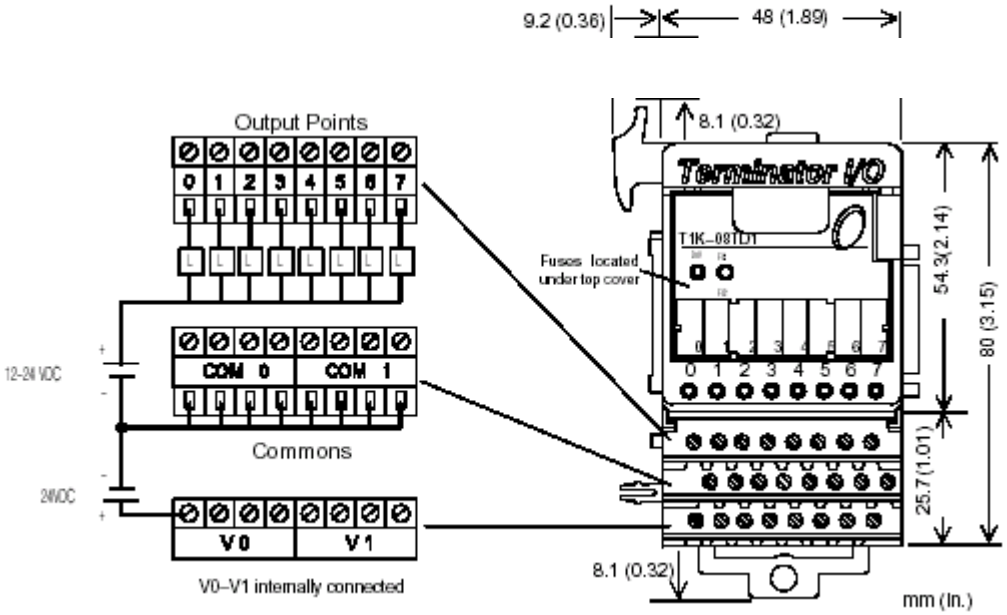
2.0 Component Description

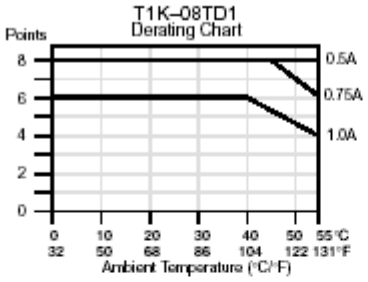
2.1 Specifications

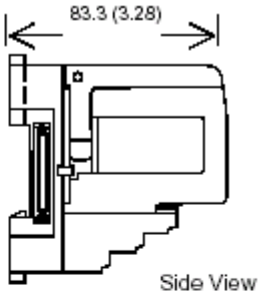
T1K-8TD1 Contact Output Module	
Outputs per module	8 (sink)
Commons per module	2 internally connected
Operating Voltage Range	6-27 VDC
Output Voltage Range	5 – 30 VDC min. / max.
Peak Voltage	50 VDC
Max. Load Current	1A / pt., 4A / common
Max. Leakage Current	15μA @ 30VDC
ON Voltage Drop	> 0.3 VDC @ 1.0A
Max. Inrush Current	2A for 100ms
OFF to ON Response	< 10μs
ON to OFF Response	< 60μs
Base Power Required	100mA @ 5VDC
External Power Required	200mA max. @ 20-28VDC
Status Indicators	Logic Side
Error Status Indications (LEDS)	24V ON = low external power FU1/FU2 ON = fuse 1 or fuse 2 blown
Weight	85g

Environmental Specifications	
Ambient Operating Temperature	32°F to 131°F (0°C to 55°C)
Storage Temperature	-4°F to 158°F (-20°C to 70°C)
Ambient Humidity	5% to 95% (Non-condensing)
Atmosphere	No corrosive gasses. The level of environmental pollution = 2 (UL 840)
Vibration Resistance	MIL STD 810C, Method 514.2
Shock Resistance	MIL STD 810C, Method 516.2
Voltage Withstand	1500VAC, 1 minute
Insulation Resistance	500VDC, 10MΩ
Noise Immunity	NEMA ICS3-304 Impulse Noise 1μs, 1000V FCC class A RFI (144MHz, 430MHz 10W, 10cm)
Agency Approvals	UL, CE, FCC class A

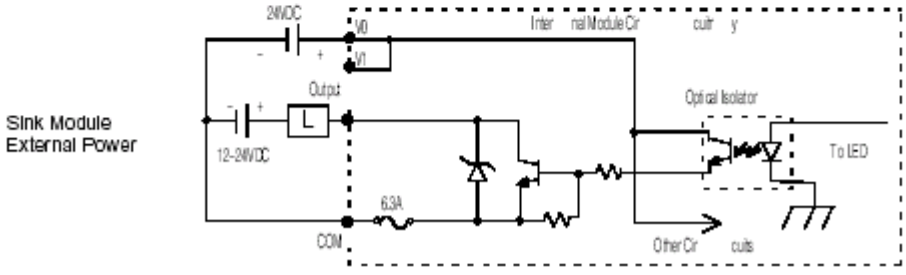
2.2 Wiring & Dimensions







Equivalent Output Circuit



SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96402	-
SCALE: NONE		SHEET 5 OF 6	

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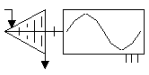
SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96402	-
SCALE: NONE		SHEET 6 OF 6	

APPLICATION		REVISION			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED



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TITLE

COMPONENT DESCRIPTION, 8 CHANNEL MILLIAMP INPUT MODULE, T1F-08AD-1

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96403	-

SCALE: NONE

Table of Contents

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96403	-
SCALE: NONE		SHEET 2 OF 6	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 8 channel, milliamp input module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

This document is intended to describe to individuals interested in the component, a broad knowledge of the component, its capabilities, its architecture, and where to locate additional detailed information.

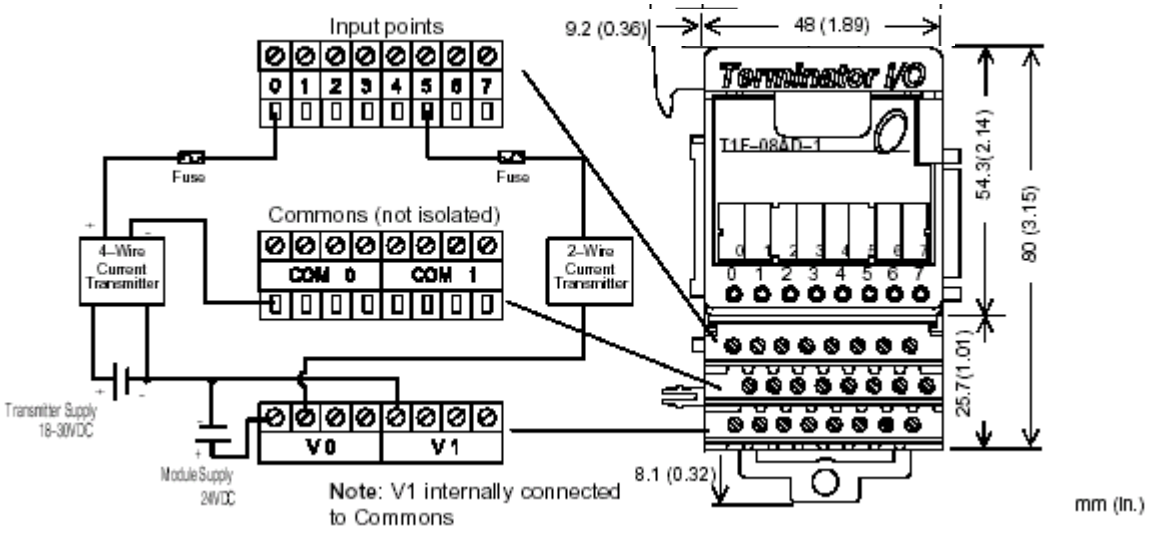
2.0 Component Description

2.1 Specifications

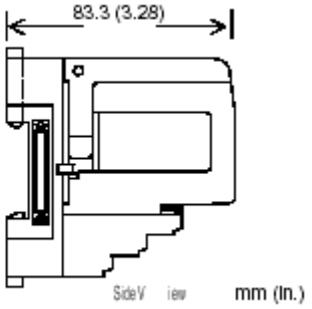
T1F-08AD-1 8 Channel Current Analog Input Module	
Number of Channels	8, single ended (1 common)
Input Range	0-20mA, 4-20mA, -20 to 20mA
Resolution	14 bit (13 bit plus sign bit)
Frequency Response	-3db @ 500Hz, -20db/decade
Input Resistance	250 ohms
Absolute Max. Ratings	8V max. input
Conversion Time	5ms per channel
Linearity Error	+/- 2 count max.
Input Stability	+/- 1 count
Full Scale Error (Offset Error not included)	16 counts max.
Offset Error	2 counts max.
Max. Full Scale Inaccuracy (% of full scale) all errors included	0.18% @ 25°C 0.36% @ 60°C
Master Update Rate	8 Channels per scan max.
Input Points Required	254 discrete pts. or 8 dwords (d (double) word = 32 bit word) Network Interface dependent
Base Power Required	75mA @ 5VDC
External Power Supply	18-30 VDC, 50mA, class 2
Recommended Fuse	0.032A, Series 217 Fast Acting
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Accuracy vs. Temperature	+/- 50 ppm / °C max. full scale
Relative Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gasses permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304
Weight	136g

Input Range Resolution	
-20 to 20mA	-8192 to 8192 counts
0 – 20mA	0 – 8192 counts
4 – 20mA	1638 – 8191 counts

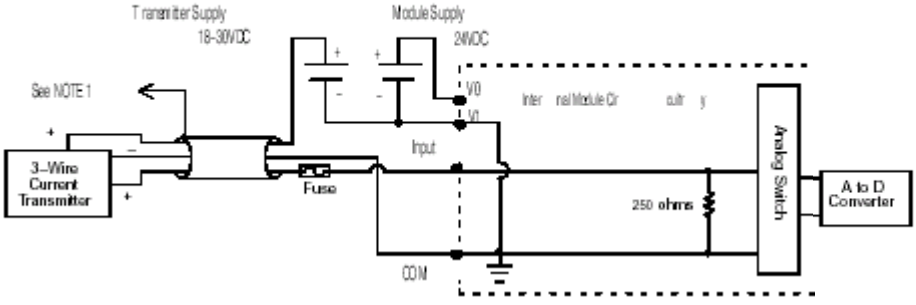
2.2 Wiring & Dimensions



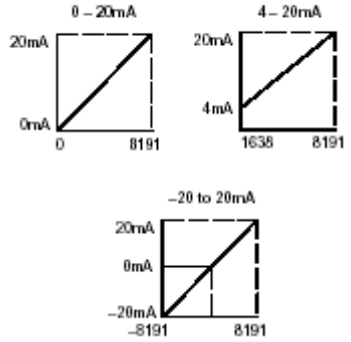
NOTES:
1: Shields should be grounded at the signal source.
2: More than one external power supply can be used, provided all the power supply commons are connected.
3: A Series 217, 0.032A fast-acting fuse is recommended for 4–20 mA current loops.
4: If the power supply common of an external power supply is not connected to the 0V terminal on the module, then the output of the external transmitter must be isolated. To avoid "ground loop" errors, recommended 4–20 mA transmitter types are:
–For 2 or 3 wire connections: Isolation between the input supply signal and the power supply.
–For 4 wire connections: Isolation between the input supply signal, the power supply and the 4–20mA output.



Equivalent Input Circuit



Input Signal Ranges



SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96403	-
SCALE: NONE		SHEET 5 OF 6	

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SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96403	-
SCALE: NONE		SHEET 6 OF 6	

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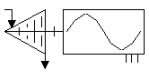

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TITLE

COMPONENT DESCRIPTION, 8 CHANNEL MILLIAMP OUTPUT MODULE, T1F-08DA-1

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96404	-

SCALE: NONE

SHEET 1 OF 6

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SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96404	-
SCALE: NONE		SHEET 2 OF 6	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*, 8 channel, milliamp output module.

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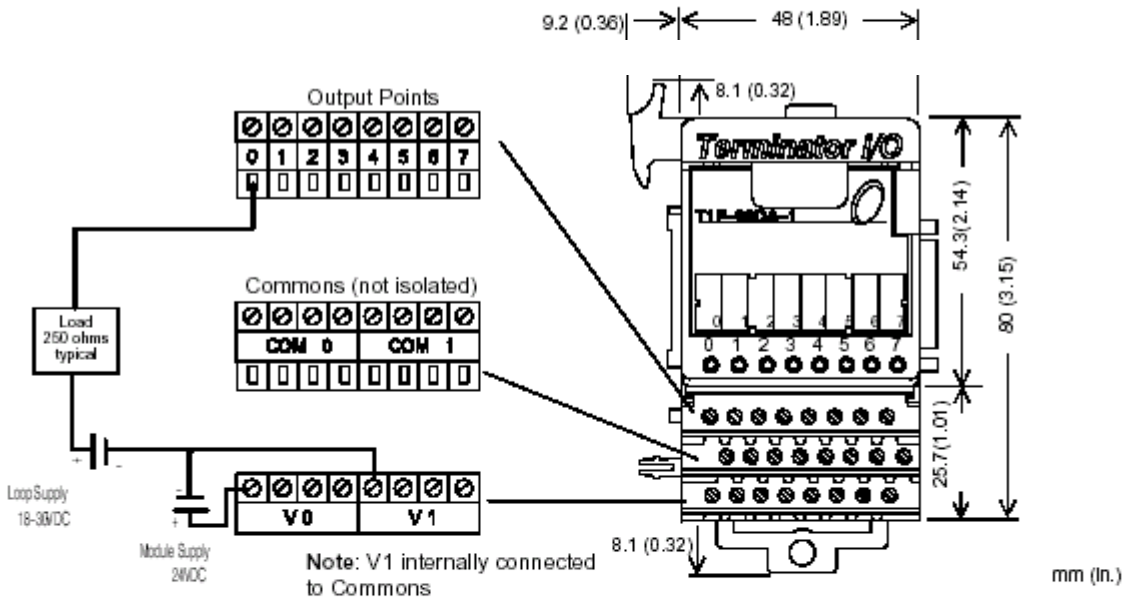
2.0 Component Description

2.1 Specifications

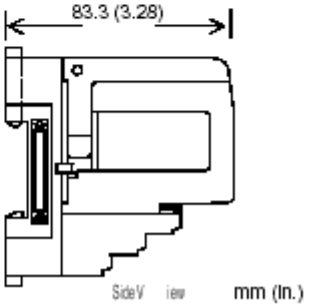
T1F-08AD-1 8 Channel Current Analog Input Module	
Number of Channels	8
Output Range	0-20mA, 4-20mA
Output Type	single ended, 1 common
Resolution	12 bit (1 in 4096)
Max. Loop Supply	30 VDC
Peak Output Voltage	30 VDC
Max. Load (ohm) / Power Supply	620/18V, 910/24V, 1200/30V
Min. Load (ohm) / Power Supply**	0/24V, 350/30V @ 40°C 250/24V, 600/30V @ 60°C
Linearity Error (end to end)	+/- 2 count max. +/- 0.050% of full scale max.
Conversion Settling Time	400μs max. full scale change
Full Scale Calibration Error	+/- 12 counts max.
Offset Calibration Error	0 – 20mA: +/- 5 counts max. 4 – 20mA: +/- 6 counts max.
Accuracy vs. Temperature	+/- 50 ppm/°C full scale calibration change
Max. Full Scale Inaccuracy (% of full scale) all errors included	0.2% @ 25°C 0.4% @ 60°C
Master Update Rate	8 channels per scan max.
Output Points Required	256 discrete pts. or 8 dwords (d (double) word = 32 bit word) Network Interface dependent
Base Power Required	75mA @ 5VDC
External Power Supply	21.6-26.4VDC, 150mA class 2
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304
Weight	145g

**max. allowable output power dissipation. For example, at 60°C and 24VDC, there must be a load of at least 250 ohms on the output circuit. Smaller loads will damage the analog output circuit.

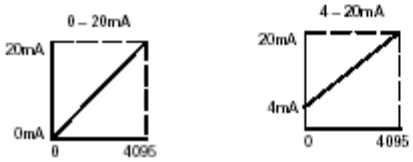
2.2 Wiring & Dimensions



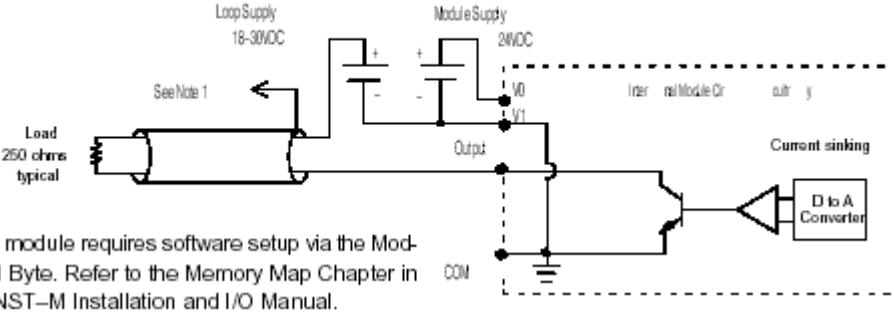
NOTES:
1: Shields should be connected to the 0V terminal of the module or the 0V of the power supply.
2. Unused current outputs should remain open (no connections) for minimum power consumption.



Output Signal Ranges



Equivalent Output Circuit



Note: This module requires software setup via the Module Control Byte. Refer to the Memory Map Chapter in the T1K–INST–M Installation and I/O Manual.

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A	1XKV4	AA96404	-
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SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96404	-
SCALE: NONE		SHEET 6 OF 6	

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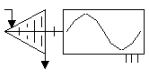

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TITLE

COMPONENT DESCRIPTION, 16 CHANNEL RTD MODULE, T1F-16RTD

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96405	-

SCALE: NONE

Table of Contents

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 16 Channel RTD input module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

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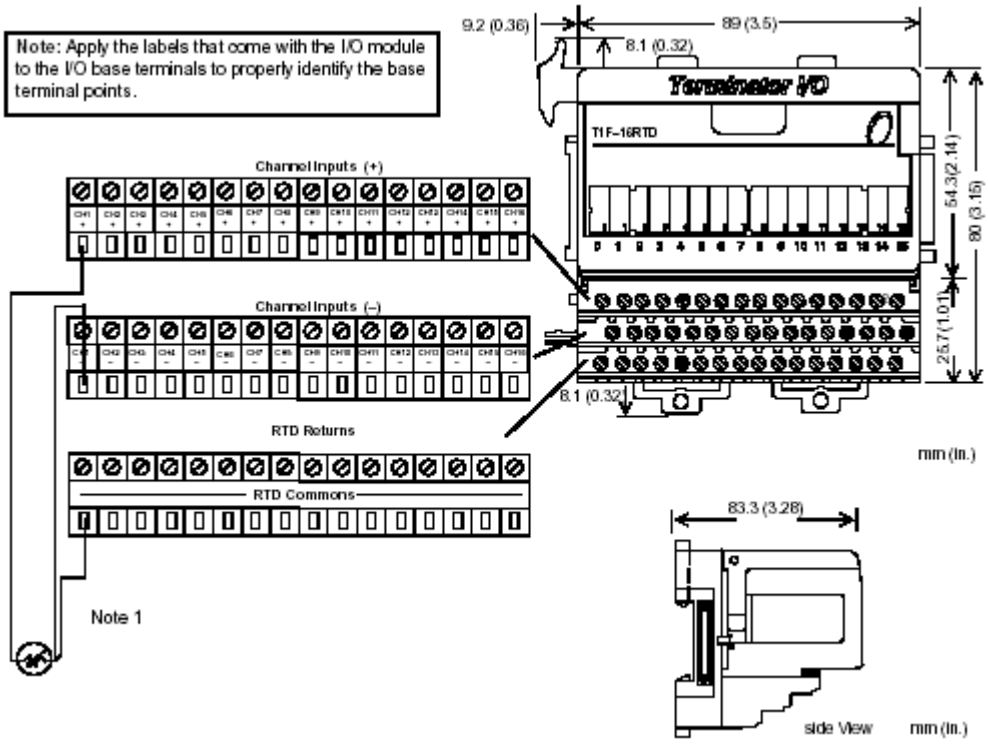
2.0 Component Description

2.1 Specifications

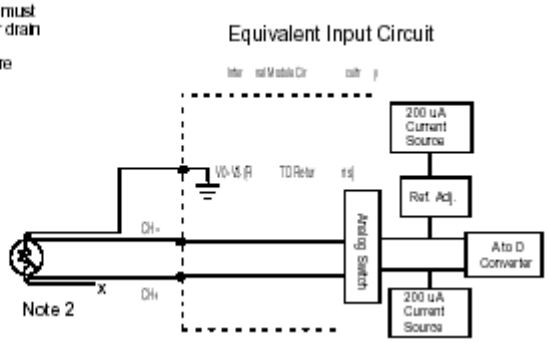
T1F-16RTD Input Module	
Number of Channels	16
Resolution	+/- 0.1°C or °F
Common Mode Range	0–5 VDC
Notch Filter	<50db notches @ 50/60 Hz f–3db=13.1Hz
Absolute Max. Ratings	+/- 50 VDC
Converter Type	Charge balancing, 24-bit
Sampling Rate	140ms / channel
Master Update Rate	16 channels per scan max.
Input Points Required	512 discrete pts. Or 16 dwords (d (double) word = 32 bit word) Network Interface dependent
Base Power Required	150mA @ 5 VDC
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Temperature Drift	25ppm / °C (max.)
Maximum Inaccuracy	+ / - 1°C
RTD Excitation Current	200μA
Relative Humidity	5 to 95% (non-condensing)
Environment Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 514.2
Noise Immunity	NEMA ICS3-304
Weight	168g

RTD Input Ranges		
RTD Type	**Range °C**	**Range °F**
Pt100Ω	-200 to 850	-328 to 1562
Pt1000Ω	-200 to 595	-328 to 1103
jPt100Ω	-38 to 450	-36 to 842
Type CU-10/25Ω	-200 to 260	-328 to 500
120Ω Nickel	-80 to 260	-112 to 500

2.2 Wiring & Dimensions



NOTES:
1: The three wires connecting the RTD to the module must be the same type and length. Do not use the shield or drain wire for the third connection.
2. If an RTD sensor has four wires, the plus sense wire should be left unconnected as shown.



SIZE	CAGE CODE	DRAWING NUMBER	REV
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SCALE: NONE		SHEET 5 OF 6	

2.3 Module Jumper Settings

Module Input Type Selection			
RTD Type	**Jumper RTD-0**	**Jumper RTD-1**	**Jumper RTD-2**
Pt100 Ω	**X**	**X**	
Pt1000 Ω			**X**
JPt100 Ω		**X**	
Type CU-10 Ω			
Type CU-25 Ω	**X**		
120Ω Nickel	**X**		**X**

Number of Channels Selection				
Number of	**Jumper**			
Channels	**CH+1**	**CH+2**	**CH+3**	**CH+4**
1				
2	**X**			
3		**X**		
4	**X**	**X**		
5			**X**	
6	**X**		**X**	
7		**X**	**X**	
8	**X**	**X**	**X**	
9				**X**
10	**X**			**X**
11		**X**		**X**
12	**X**	**X**		**X**
13			**X**	**X**
14	**X**		**X**	**X**
15		**X**	**X**	**X**
16	**X**	**X**	**X**	**X**

APPLICATION		REVISION			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED

TURBINE DIAGNOSTIC SERVICES, INC
13447 BYRD DR
ODESSA, FL 33556

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TOLERANCES ARE:

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CONTRACT:

DRAWN

CHK: THB 11/7/07

ENG:

TITLE

COMPONENT DESCRIPTION, 14 CHANNEL THERMOCOUPLE MODULE, T1F-14THM

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96406	-

SCALE: NONE

Table of Contents

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96406	-
SCALE: NONE		SHEET 2 OF 8	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 14 Channel Thermocouple input module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

This document is intended to describe to individuals interested in the component, a broad knowledge of the component, its capabilities, its architecture, and where to locate additional detailed information.

2.0 Component Description

2.1 Specifications

T1F-14THM Thermocouple Input Module	
Use with I/O Module Base	T1K-16B screw type terminal base only
Number of Channels	14, differential
Common Mode Range	+/- 5VDC
Common Mode Rejection	90db min. @ DC 150db min. @ 50/60 Hz
Input Impedance	1M ohm
Absolute Max. Ratings	Fault Protected Input +/- 50 VDC
Master Update Rate	14 channels per scan max.
Input Points Required	512 discrete pts. or 16 dwords (d (double) word = 32 bit word) Network Interface dependent
Base Power Required	60mA @ 5 VDC
External Power Supply	24VDC +/- 5%, 70mA, class 2
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Accuracy vs. Temperature	+/- 5 ppm / °C max. full scale
Relative Humidity	5 to 95% (non-condensing)
Environment Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 514.2
Noise Immunity	NEMA ICS3-304
Weight	168g

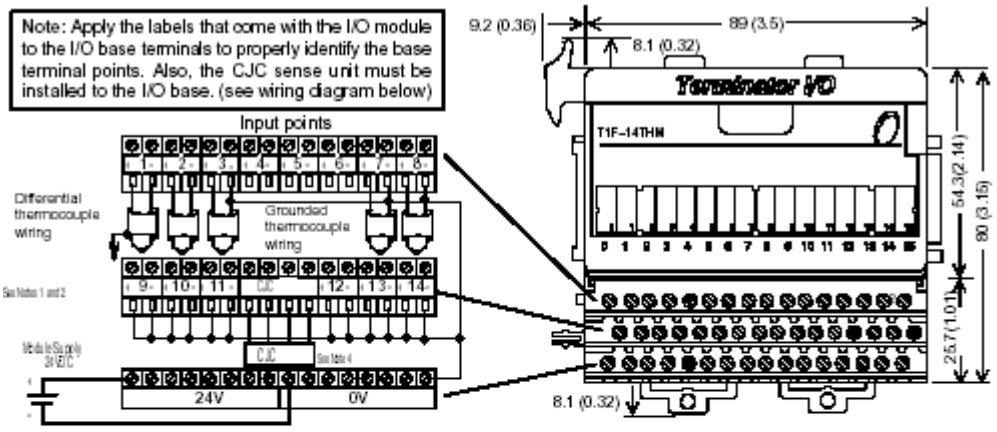
Thermocouple (TC) Specifications		
Input Ranges		
TC Type	**Range °C**	**Range °F**
J	-190 to 760	-310 to 1400
E	-210 to 1000	-346 to 1832
K	-150 t0 1372	-238 to 2502
R	65 to 1768	149 to 3214
S	65 to 1768	149 to 3214
T	-230 to 400	-382 to 752
B	529 to 1820	984 to 3308
N	-70 to 1300	-94 to 2372
C	65 to 2320	149 to 4208

Display Resolution	+/- 0.1°C or +/- 0.1°F
Cold Junction Compensation (CFC Part #: T1F-CFC)	Automatic
Conversion Time	100ms per channel
Warm Up Time	30 minutes typically, +/- 1°C repeatability
Linear Error	+/- 0.05°C max. +/- 0.01°C typical
Maximum Inaccuracy	+/- 3°C

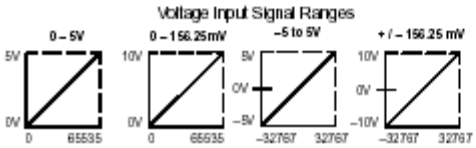
Voltage Specifications	
Input Voltage Range	0-5V, +/- 5V, 0-156.25mV, +/-156.25mV
Resolution	16 bit (1 in 65535)
Full Scale Calibration Error (Offset Error Included)	+/- 13 counts typ. +/- 33 max.
Offset Calibration Error	+/- 1 count max. @ 0V input
Linearity Error (End to End)	+/- 1 count max.
Max. Inaccuracy	+/- 0.02% @ 25°C (77°F)

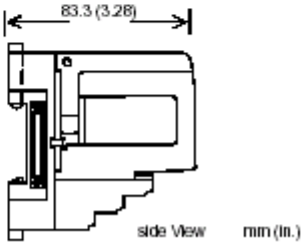
SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96406	-
SCALE: NONE		SHEET 5 OF 8	

2.2 Wiring & Dimensions

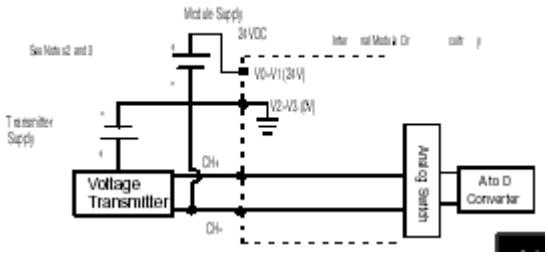


NOTES:
1: Shields should be grounded at the signal source.
2: Unused inputs should be connected to Common (0VDC).
3. When using 0–156mV and 5V ranges, connect (–) or 0V terminals to 0V to ensure common mode range acceptance
4. The Cold Junction Compensation (part #: T1F–CJC) temperature sense unit that comes with the module must be installed into the I/O base terminals to perform CJC of the thermocouple inputs.





Equivalent Input Circuit



SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96406	-
SCALE: NONE		SHEET 6 OF 8	

2.3 Module Jumper Settings

Input Type Selection				
Thermocouple/	Jumper			
Voltage Inputs	TC Type 0	TC Type 1	TC Type 2	TC Type 3
J	X	X	X	X
K		X	X	X
E	X		X	X
R			X	X
S	X	X		X
T		X		X
B	X			X
N				X
C	X	X	X	
0-5V		X	X	
+/- 5V	X		X	
0-156mV			X	
+/-156mV	X	X		

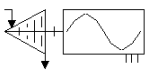
Number of Channels Selection				
Number of	Jumper			
Channels	CH+1	CH+2	CH+3	CH+4
1				
2	X			
3		X		
4	X	X		
5			X	
6	X		X	
7		X	X	
8	X	X	X	
9				X
10	X			X
11		X		X
12	X	X		X
13			X	X
14	X	X	X	X

Temperature Conversion Units				
	Magnitude Plus Sign		2's Complement	
Jumper	**°F**	**°C**	**°F**	**°C**
Units-0	**X**		**X**	
Units-1	**X**	**X**		

Voltage Conversion Units		
	Magnitude	**2's**
Jumper	**Plus Sign**	**Complement**
Units-0	**X**	**X**
Units-1	**X**	

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	**1XKV4**	**AA96406**	**-**
SCALE: NONE		SHEET 8 OF 8	

APPLICATION		REVISION			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
	2221				



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TITLE

COMPONENT DESCRIPTION, 8 CHANNEL VOLTAGE INPUT MODULE, T1F-08AD-2

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96407	-

SCALE: NONE

SHEET 1 OF 6

Table of Contents

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96407	-
SCALE: NONE		SHEET 2 OF 6	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 8 Channel Voltage Input module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

This document is intended to describe to individuals interested in the component, a broad knowledge of the component, its capabilities, its architecture, and where to locate additional detailed information.

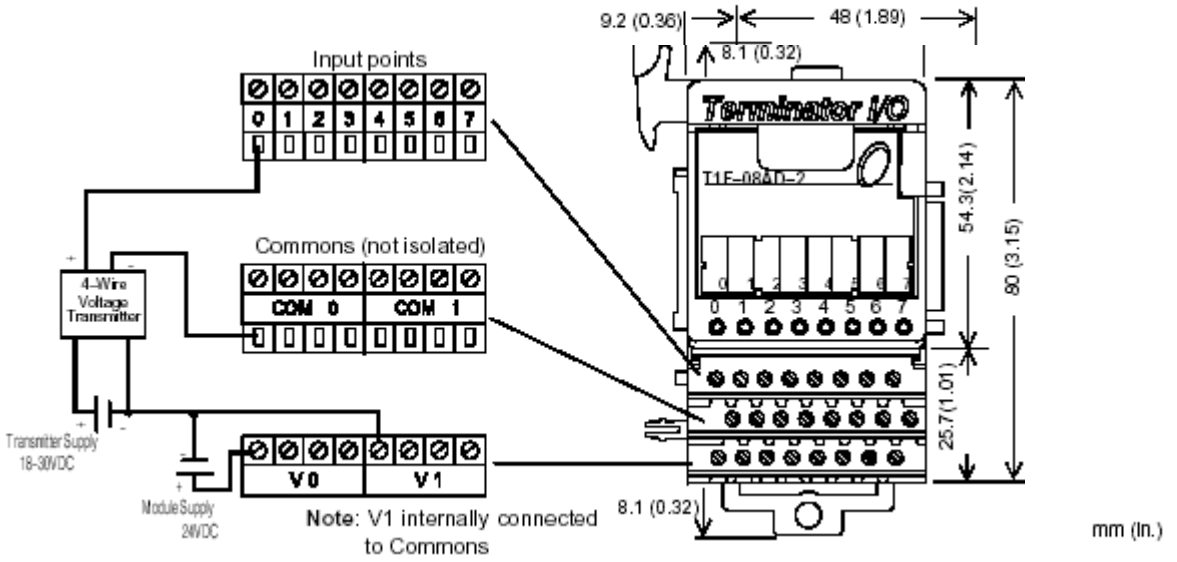
2.0 Component Description

2.1 Specifications

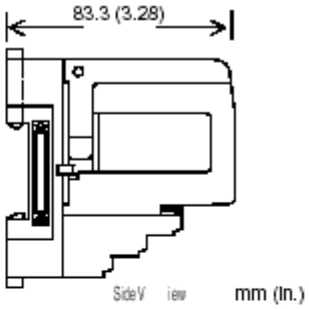
T1K-08AD2 Voltage Input Module	
Number of Channels	8, single ended (1 common)
Input Ranges	0-5V, 0-10V, +/- 5V, +/- 10V
Resolution	14 bit (13 bit plus sign bit)
Frequency Response	-3db @ 500Hz, -20db/decable
Input Resistance	200KΩ min.
Absolute Max. Ratings	Fault Protected Input 130V(rms) or 100VDC
Conversion Time	5ms per channel
Linearity Error	+/- 2 count max.
Input Stability	+/- 1 count
Calibration Full Scale Error	8 counts max.
Calibration Offset Error	2 counts max.
Max. Full Scale Inaccuracy (% of full scale); all errors included	0.08% @ 25°C 0.26% @ 60°C
Master Update Rate	8 channels per scan max.
Input Points Required	256 discrete pts. or 8 dwords (d (double) word = 32 bit word) Network Interface dependent
Base Power Required	75mA @ 5VDC
External Power Supply	18-30 VDC, 50mA, class 2
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Accuracy vs. Temperature	+/- 50 ppm / °C max. full scale
Relative Humidity	5 to 95% (non-condensing)
Environment Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304
Weight	136g

Input Range Resolution	
0 – 5V	0 – 4095 counts
0 –10V	0 – 8191 counts
+/- 5V	-4095 to 4095 counts
+/- 10V	-8192 to 8191 counts

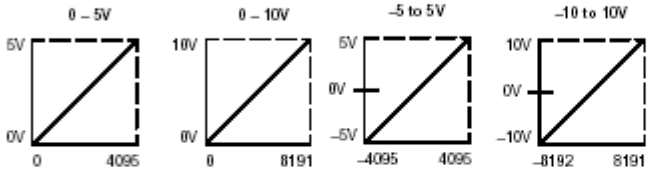
2.2 Wiring & Dimensions



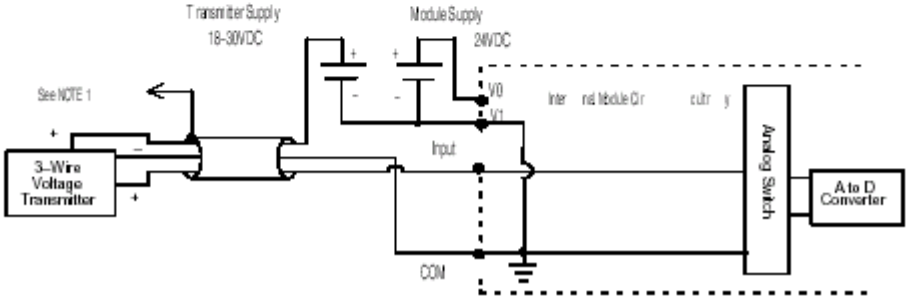
NOTES:
1: Shields should be grounded at the signal source.
2: Unused Inputs should be connected to Common (0VDC).
3: More than one external power supply can be used, provided all the power supply commons are connected.



Input Signal Ranges



Equivalent Input Circuit



SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96407	-
SCALE: NONE		SHEET 5 OF 6	

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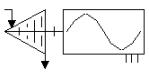
SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96407	-
SCALE: NONE		SHEET 6 OF 6	

APPLICATION		REVISION			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
	2221				



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CHK: THB 11/7/07

ENG:

TITLE

COMPONENT DESCRIPTION, 8 CHANNEL VOLTAGE OUTPUT MODULE, T1F-08DA-2

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96408	-

SCALE: NONE

SHEET 1 OF 6

Table of Contents

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96408	-
SCALE: NONE		SHEET 2 OF 6	

1.0 Document Purpose

The purpose of this System Description document is to provide a general overview of the Turbine Diagnostic Services Inc., TurboNet *Dash 1*®, 8 Channel Voltage Output module.

This document is not intended to provide the details required to set up, program, operate, or troubleshoot the component. This document will provide brief descriptions intended to familiarize engineers, managers, technicians, and operators with the component and its expectations. This document will also provide references to other documentation providing additional details.

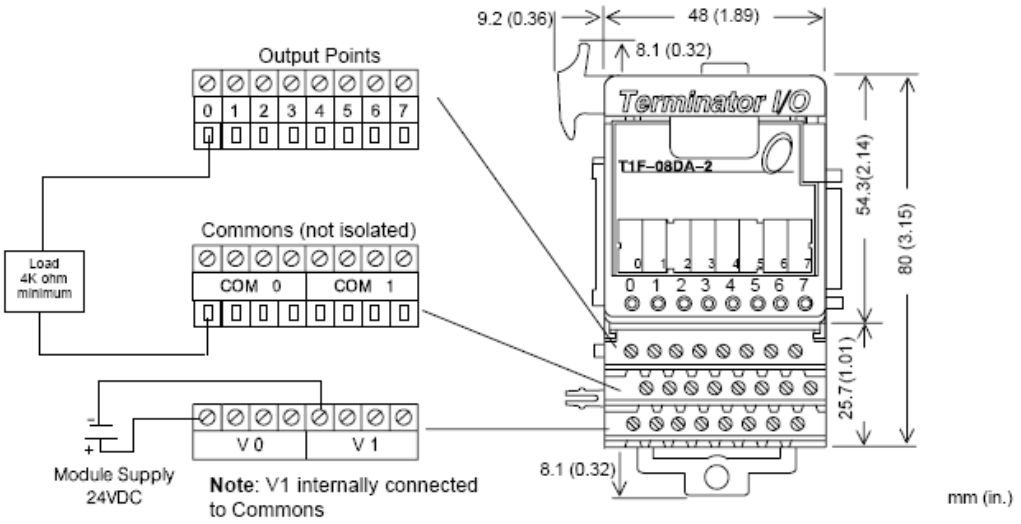
This document is intended to describe to individuals interested in the component, a broad knowledge of the component, its capabilities, its architecture, and where to locate additional detailed information.

2.0 Component Description

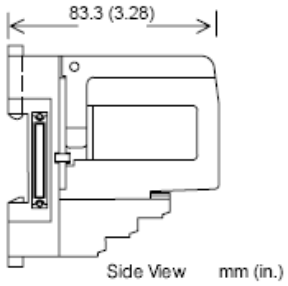
2.1 Specifications

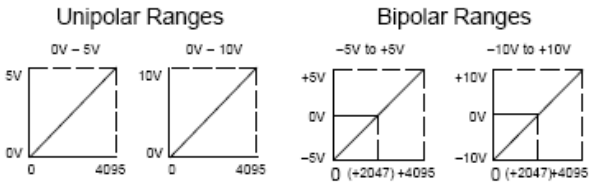
T1F-08DA-2 Voltage Output Module	
Number of Channels	8
Output Ranges	0-5V, 0-10V, +/- 5V, +/- 10V
Output Type	single ended, 1 common
Resolution	12 bit (1 in 4096)
Peak Output Voltage	15 VDC
Load Impedance	4K ohm min.
Load Capacitance	0.01μF max.
Linearity Error (end to end)	+/- 2 count max. +/- 0.050% of full scale max.
Conversion Setting Time	100μs max. full scale change
Full Scale Calibration Error	+/- 12 counts max.
Offset Calibration Error	10V ranges: +/- 6 counts max. 5V ranges: +/- 11 counts max.
Accuracy vs. Temperature	+/- 50 ppm / °C full scale calibration change
Max. Full Scale Inaccuracy (% of full scale); all errors and temperature drift included	10V ranges: +/- 0.2% @ 25°C +/- 0.4% @ 60°C 5V ranges: +/- 0.3% @ 25°C +/- 0.5% @ 60°C
Master Update Rate	8 channels per scan max.
Output Points Required	256 discrete pts. or 8 dwords (d (double) word = 32 bit word) Network Interface dependent
Base Power Required	75mA @ 5VDC
External Power Supply	21.6-26.4 VDC, 150mA class 2
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	5 to 95% (non-condensing)
Environment Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304
Weight	145g

2.2 Wiring & Dimensions

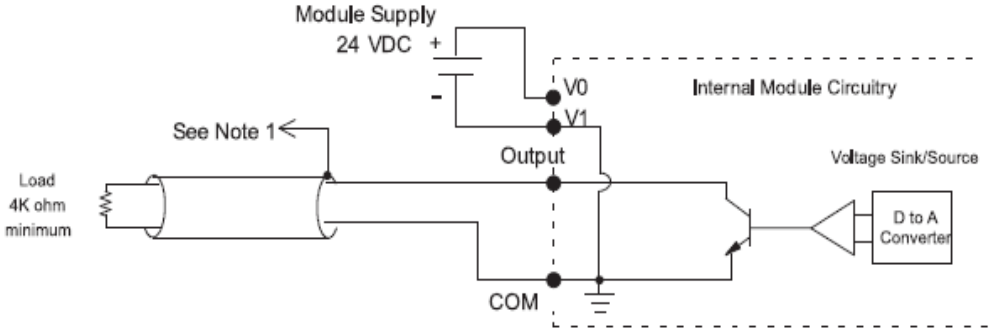


NOTES:
1: Shields should be connected to the 0V terminal of the module ot the 0V terminal of the power supply.
2. Unused voltage outputs should remain open (no connections) for minimum power consumption.





Equivalent Output Circuit



NOTES:

1: Shields should be connected to the 0V terminal of the module or the 0V of the power supply.

2. Unused current outputs should remain open (no connections) for minimum power consumption.

SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96408	-
SCALE: NONE		SHEET 5 OF 6	

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SIZE	CAGE CODE	DRAWING NUMBER	REV
A	1XKV4	AA96408	-
SCALE: NONE		SHEET 6 OF 6	