

Bently Nevada 3500/25 149776-01

DATASHEET

2018/10/17

CAMBIA GROUP

149744 Trendmaster* Dynamic Scanning Module

Product Datasheet

Bently Nevada * Asset Condition Monitoring



Description

The 149744 Trendmaster* Dynamic Scanning Module (DSM) is a compact rack-based data acquisition system that is fully integrated with System 1* software. The DSM rack has a total of 5 card slots. The first slot is dedicated for communications and will accept either the copper or fiber Ethernet card. The second slot is reserved. The 3rd to 5th slots are TIM Input card or reserved.

The TIM input card connects to Bently Nevada* TIM and proTIM* modules. Each TIM input card provides 2 TIM lines, and each TIM line supports up to 254 channels. Input cards offer high-resolution sampling with onboard real-time processing. Onboard processing is the key to the powerful and efficient features available with the DSM platform. Because each input card can process data locally, the DSM can return post-processed variables to the host computer and reduce the required network bandwidth. If the host computer requires raw data, the DSM can also return waveforms and spectrums.

Modbus Communications Capability

The introduction of a Modbus digital interface now permits DSMs to communicate directly with process control and automation systems without the need for additional hardware. This capability provides a low-cost entry-level alternative to System 1 that uses the basic trending and alarming functionality that is integral to existing process control systems. All DSMs now include Modbus over TCP/IP capability and require only the DSM Modbus Exporter software to configure all the DSM Modbus inputs and define the Modbus interface. The DSM requires the Modbus Serial to Ethernet Bridge for RS232/485 Modbus communication. See the accessory section of this datasheet for the Modbus Exporter software and Serial to Ethernet Bridge part numbers.



imagination at work

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Rev. Y

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DSM Features

- Fully integrated with System 1 and Decision Support*
- Ethernet Modbus server with or without System 1
- Up to 150 DSMs per single data acquisition computer
- Small package, 21cm x 13 cm x 11cm (8.3 in x 5.1 in x 4.3 in)
- Choice of copper or fiber Ethernet
- Synchronous and asynchronous processing
- Automatic self-checking for DSM and Input cards, and transducers
- Up to 24 kHz high bandwidth inputs
- Up to 16-bit high resolution sampling
- Up to 16x auto gain
- TIM (Transducer Interface Module) support for:
 - Acceleration, velocity, and proximity sensors
 - 4-20 mA, 1-5 V, and 0-10 V transmitters
 - J and K thermocouples and platinum RTD
 - Up to 508 channels per card
- Onboard processing for:
 - True RMS and peak-peak
 - 1X, 2X, and not 1X variable
 - User configurable high-pass and band-pass filters
 - Integrated variables and waveforms
 - Configurable spectrums up to 3200 lines
 - Spectrum windowing, averaging, and overlap
 - Standard and enhanced high-frequency enveloping

Specifications

DSM Rack (149744)

Input Voltage

Power connector located on communications card.

20 to 30 Vdc

Input Power

18 watts maximum

Fuse Rating

1 amp slow-blow

10/100 TX Copper Ethernet Card (149776-01)

Status LED

Tri-color LED indicates status of DSM and input modules with combinations of colors and flash rates

Link/Activity LED

Tri-color LED indicates network link status

Connector Type

RJ45

Communications

DSM to System 1

TCP/IP

UDP for initialization

Modbus

Operates with or without System1

Modbus over TCP/IP

Up to 6 clients

0.5 sec response time

Baud Rate

10 Base T or 100 Base TX, auto-negotiating

Cable Length

100 meters (328 feet)

Category 5, twisted pair

100 FX Fiber Ethernet Card (149776-02)

Status LED

Tri-color LED indicates status of DSM and input modules with combinations of colors and flash rates

Link/ACT LED
Tri-color LED indicates network link status

Connector type
MT-RJ

Communications
DSM to System 1

TCP/IP
UDP for initialization

Modbus
Operates with or without System1
MODBUS over TCP/IP
Up to 6 clients
0.5 sec response time

Operation Protocol
TCP/IP, BN protocol
UDP for initialization only

Baud Rate
100 base FX only

Cable Length
400 meters (1312 feet) multimode fiber optic cable (half duplex)
2000 meters (6562 feet) multimode fiber optic cable (full duplex)

TIM Input Card (149787-01)

Input Lines
Both lines sampled simultaneously
2 lines per card
127 pro-TIMs per line

Supported TIMs
All proTIM modules
1900/15
1900/25
1900/55

TIM Cable Length
1200 meters (4000 feet)

A/D Resolution
14 bits

Accuracy
 $\pm 2\%$ of full-scale range

Short Circuit Current Limit
43 mA maximum

Hardware Frequency Response (3 dB corners)
1/3 Hz and 20 kHz
Refer to TIM and transducer specifications for more information

Direct Filter
2-pole high-pass, 1 Hz to 12.8 kHz

Prime Spike Filter
4-pole high-pass, 1 Hz to 12.8 kHz
2-pole low-pass, 10 Hz to 12.8 kHz

Rotor Region Filter
2-pole high-pass, 1 Hz to 12.8 kHz
2-pole low-pass, 10 Hz to 12.8 kHz

High Frequency Filter
4-pole high-pass, 1 Hz to 12.8 kHz

Synchronous Waveforms (Software configurable)

Frequency Span
32, 64, and 128 samples per revolution
20 to 36,000 CPM

Waveform Size
8192 samples maximum

Filter
No anti-alias filter on synchronous path

Asynchronous Waveforms (Software configurable)

Frequency Spans
20 Hz
50 Hz

	100 Hz
	200 Hz
	500 Hz
	1000 Hz
	2000Hz
Sample Rates	
	51.2 Hz
	128 Hz
	256 Hz
	512Hz
	1280 Hz
	2560 Hz
	5120 Hz
	12800 Hz
	25600 Hz
Spectral Lines	
	100
	200
	400
	800
	1600
	3200
Spectrum averages	
	Up to 8
Windowing	
	None, flat-top, or hanning

General

Dimensions (Length x Width x Height)

21.6 cm x 13.3 cm x 11.4 cm (8.51 in x 5.24 in x 4.5 in)

Weight

DSM with no input cards

0.76 kg (1.7 lbm)

Input card

0.2 kg (0.44 lbm)

Power supply

0.5 kg (1.1 lbm)

Mounting

DIN rail option

35mm DIN rail. Requires 26.7 cm (10.5 in) rail length.

Weatherproof housing

35mm DIN rail. Requires 26.7 cm (10.5in.) rail length.

Bulkhead option

Requires 4 #8 screws required.

Environmental Limits

Operating Temperature

-20 °C to +65 °C (-4 °F to +149° F)

Storage Temperature

-40 °C to +85 °C (-40 °F to +185 °F)

Operating or Storage Humidity

95%, non-condensing

100% condensing when installed in weatherproof housing with power applied.

Vibration

2 g's (10 to 55 Hz)

10 g's (55 to 500 Hz)

Shock

6-inch drop to plywood surface (installed in terminal base)

Compliance and Certifications

EMC

Standards:

EN 6100-6-2 Immunity for Industrial Environments

EN 61000-6-4 Emissions for Industrial Environments

EN 61326-1 Electrical Equipment for Measurement, Control and Laboratory use- EMC requirements

European Community Directives:

EMC Directive 2014/30/EU

Electrical Safety

Standards:

EN 61010-1

European Community Directives:

LV Directive 2014/35/EU

The equipment must be supplied by a limited energy rated power supply.

ATEX/IECEx:



Ex nA IIC T4 Gc

Ex nA [ic] IIC T4 Gc

Ex nA op is [op is T4 Gc] IIC T4 Gc

T4@ -20 °C ≤ Ta ≤ +65 °C

Entity Parameters [ic] IIC

TIM (SPA) Input Card: Um = 30V

PWR	SIG+/SIG-
Uo = 13.37V	Uo = 0.2V
Io = 41.7mA	Io = 0.018mA
Po = 558mW	Po = 0.0036mW
Co = 200nF	
Lo = 0.305mH	

Hazardous Area Approvals

For a detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (document 108M1756) located at the following website: www.GEmeasurement.com.

North America:



Ex nA IIC T4 Gc

Ex nA [ic] IIC T4 Gc

Class I, Div 2, Groups A, B, C, D

Class I, Zone 2, AEx nA IIC T4 Gc

Class I, Zone 2, AEx nA [ic] IIC T4 Gc

Class I, Zone 2, AEx nA op is [op is T4 Gc] IIC T4 Gc

Class I, Div. 2, Groups A, B, C, D

T4@ -20 °C ≤ Ta ≤ +65 °C

When installed per DWG 163796

Ordering Information

For a detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (document 108M1756) located at the following website: www.GEmeasurement.com.

149744 – AXX – BXX – CXX – DX – EXX – FXX – GXX – HXX

A: Power Input	01	110/220 V 50-60 Hz
	02	+24 Vdc
B: Communication	01	10/100baseT Ethernet
	02	Fiber Optic Ethernet
C: Input Board 1	00	None
D: Input Board 2	00	None
	01	TIM input card
E: Input Board 3	00	None
	01	TIM input card
F: Input Board 4	00	None
	01	TIM input card
G: Mounting	01	Bulkhead mount
	02	DIN Rail mount
	03	Weatherproof enclosure
H: Approvals	00	No approvals
	05	Multiple approvals (CSA/ATEX/IECEX)

Accessories

Use the part numbers listed in this section to order spare parts or additional components for your Trendmaster DSM system.

3060/56

DSM Modbus Exporter Software.

149776-01

Spare 10/100 Base T Ethernet Communication Card.

149776-02

Spare Fiber Optic Ethernet Communication Card.

149787-01

Spare TIM Line Input Card.

149833-01

Blank Slot Cover.

02200794

+24V Power Supply.

162003

Power Supply to DSM Wiring Harness.

162222-01

Weatherproof Housing.

161692

TIM Line Surge Protector Plug. Also requires Part 161693.

161693

TIM Line Surge Protector Base. Also requires Part 161692.

03839240

TIM Line Cable Seal. 5.1 mm to 6.7 mm (0.20 in to 0.27 in).

162261

Trendmaster DSM SPA Cable. Mates with 162560.

162560

SPA 5-position DIN Rail Terminal Block. Mates with 162261.

43501

Low Pressure Cable Seal.

163723

EMI Ferrite Suppressor. For round cable.

164466-01

Ethernet Component Specification.

172555

Modbus Serial to Ethernet Bridge.

162459-01

Trendmaster Galvanic Isolator.

149823

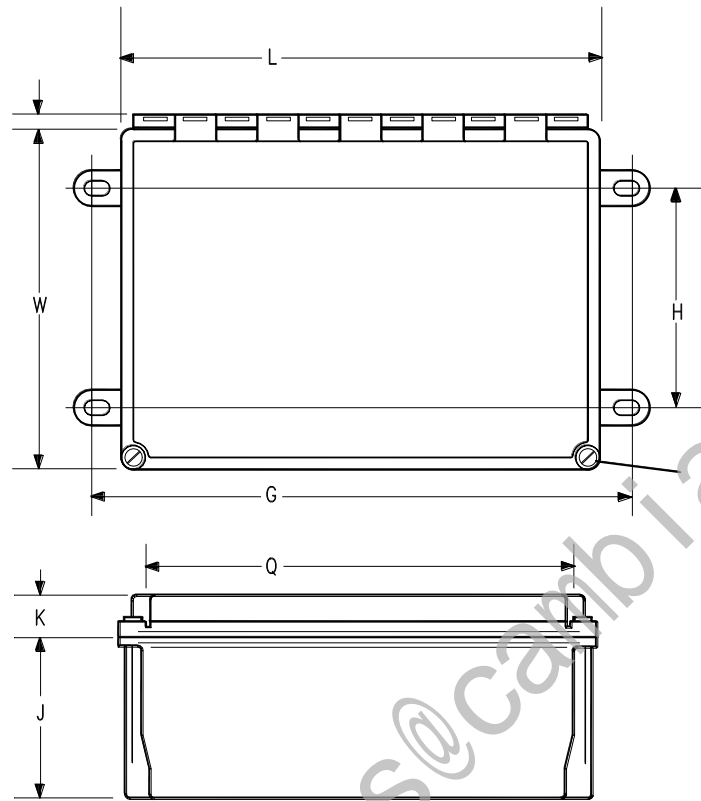
Trendmaster Installation Manual

Bently_Manuals

Customer DVD containing all Bently Manuals, FWD, App Notes, and Install Guides in all available languages

Graphs and Figures

Note: All dimensions shown in millimetres (inches) except as noted.



L = 370 mm (14.55 in)

H = 274 mm (10.00 in)

W = 319 mm (12.55 in)

G = 379 mm (14.94 in)

J = 165 mm (6.5 in)

K = 46 mm (1.61 in)

Q = 260 mm (10.25 in)

Figure 1: Weatherproof Housing Dimensions

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