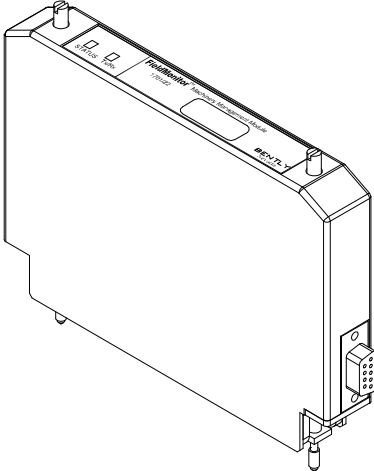# Описание на модули интерфейса управления. Модель 1701/22

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1701/22 FieldMonitor™ Management Interface Module

Bently Nevada™ Asset Condition Monitoring

Description

The 1701/22 FieldMonitor™ Management Interface Module (FMIM) is a highly-integrated module that provides the information interface to software that manages machine performance. The module captures data values and waveform files under transient, alarm and steady state conditions and provides this information to Data Manager® 2000 machine management, Machine Condition Manager™ 2000 decision support software, and System 1® software (starting with version 4.0).

The module inserts directly into the 1701 terminal base on the machine skid to form one management node. It provides the data interface for up to 8 channels of monitor data. It can then interconnect with additional management nodes to form a distributed machinery management data collection system. The module draws its power from the 1701 system, accepts transducer signals pre-wired in the terminal base, and communicates using an Ethernet local area network.

Specifications

Inputs

Dynamic signal

Digitally sampled waveform passed from monitors via terminal base.

Static signal

Overall amplitude and gap values are passed digitally from monitors via terminal base.

Network signal

9-pin D series female connector for Ethernet connection.

Inter-module signals

9-pin Euro terminal for Keyphasor® signals between nodes. Connector accepts wire gauges from 16 to 26 AWG.

Outputs

Status LED

Tri-color LED indicates status of power, Keyphasor transducer, configuration, and module by combinations of color and flash rate.

TX/RX LED

Tri-color LED indicates status of Ethernet link and transmission by combination of color and flash rate.

Conditioned Keyphasor

See Keyphasor Signal topic below.

Signal Conditioning - Specified at +25°C (+77° F).

Direct

Refer to the monitor data sheet for direct specifications

Gap

Refer to the monitor data sheet for gap specifications

1X, 2X Amplitude

Range

Same as Direct value

Accuracy

± 0.5 % FS, (20 to 60000 cpm)

Filter Response

Constant Q filter. Q = 11. Stopband begins at ± 0.14 times the center frequency. Minimum rejection in stopband is –57 dB. Filter settles in 19 shaft revolutions (100% settled)

1X, 2X Phase

Range

0 to 359 degrees

Accuracy

±1 degree (100 mV minimum amplitude at 60000 cpm)

Filter Response

Constant Q filter. Q = 11. Stopband begins at ± 0.14 times the center frequency. Minimum rejection in stopband is –57 dB. Filter settles in 19 shaft revolutions (100% settled)

Minimum Amplitude

Phase is marked invalid for signal amplitudes less than 5.4 mV.

Not 1X

Range

Same as Direct value

1X Rejection

Constant Q notch filter. Q = 2.98. Stopband begins at 0.97 and 1.03 times the center frequency (1X). Minimum rejection in stopband is –30.45 dB

Accuracy

± 3%

Frequency Range

    7.2 Hz to 15.8 times speed (32X sample rate)

    7.2 Hz to 31.8 times speed (64X sample rate)

    7.2 Hz to 63.8 times speed (128X sample rate)

Keyphasor Signal Conditioning
Transducer Input

Speed range

    20 to 60000 cpm

Speed Accuracy

    ±0.01% FS (7 Vpp square wave input)

Voltage range

    0 to –24 Vdc

Duty Cycle

    Greater of 1% or 50 µs

Minimum Amplitude

    0.5 Vpp (square wave)

Hysteresis range

    0.2 V to 2 V (0.1 V increments)

Error detection

    Not OK for voltage more positive than –1 Volt, data invalid for greater than ±25% period changes between shaft revolutions.

Phase reference

    Software selectable for leading edge of notch or projection.

Conditioned Output

Voltage

    Fixed width differential pulse.

    High +1.5 V minimum, +5 V maximum.

    Low –1.5 V minimum, -5 V maximum.

Line length

    30.4 m (100 ft.) maximum

Conditioned Input

Voltage:

    Differential pulse.

    High greater than +0.8 V.

    Low less than –0.8 V.

Common mode range

    -7 V to +12 V

Dynamic Data
Synchronous Waveforms

Sample rate

    Software selectable.

    128 samples / revolution (20 to 15000 cpm).

    64 samples / revolution (20 to 30000 cpm).

    32 samples / revolution (20 to 60000 cpm).

Length

    1024 samples.

Filter Response

    No anti-alias filters on synchronous path.

Asynchronous Waveforms

    Frequency Spans

    Software specified 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000 Hz corresponds to sample rates of 128, 256, 512, 1280, 2560, 5120, 12800, 25600, 51200 Hz respectively.

    Length

    1024 samples.

    Filter Response.

Module attenuates frequencies outside of the configured frequency span –80 dB minimum.

Noise Floor

Less than 0.002 V pp

Data Buffers:

Note: Static records consist of one value for each of the conditioned outputs (direct, gap, 1X and 2X amplitude and phase and Not 1X) along with status; dynamic records consist of 1 synchronous and 1 asynchronous waveform:

Delta Time Buffer

Capacity:

320 static records and 32 waveform records. (Module takes waveforms within 4 seconds after the even minute.)

Capture interval

Static records every 4 seconds. waveforms every 40 seconds (10:1 ratio).

Transient (RPM based) Buffer

Quantity

2 independent identical buffers

Capacity

320 static records and 32 waveform records. (40 static and 4 time based waveform records just prior to buffer trigger, 280 static and 28 waveform records are post-trigger rpm based.)

RPM capture Interval

1 to 60000 rpm.

Maximum capture rate

50 records/second.

Trigger modes

Startup captures data in increasing rpm direction only.

Coast-down captures data in both increasing and decreasing directions.

Alarm Buffer

Capacity

40 static records and 4 waveform records.

Update rate

Static records every 4 seconds, waveforms every 40 seconds (10:1 ratio). A waveform is taken at the time of the alarm buffer trigger.

Trigger modes

Alert or danger alarm event in monitor or by software command.

Ethernet Signals

Baud Rate

10 Mbps fixed rate

Protocol

TCP/IP with BNC proprietary message content.

Interface

Interface conforms to ISO/IEC 8802-3 1996 (formerly IEEE 802.3)

Cable length

100 m (328 ft) maximum

Connection

9-pin female D style connector.

General

Dimensions (H x W X L)

173 x 22 x 114 mm (6.8 x 0.9 x 4.5 in)

Weight

0.45 kg (1 lbm.)

Power Consumption

2.3 W (maximum over temperature range)

Mounting

Keyphasor slot of 1701 terminal base, fastened with 2 6-32 captive screws.

Environmental Limits

Operating Temperature:

-20 °C to +70 °C (-4 °F to +158 °F).

Storage Temperature:

-40 °C to +85 °C (-40 °F to +185 °F).

Operating or storage humidity:

95%, non-condensing.

Vibration:

2 g's (10 to 500 Hz)

Shock:

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

CE Approvals

EMC Directives:

FMIM has the CE mark and is approved for installation within the European Union and EEA regions. FMIM has been designed and tested to meet the listed directives.

EMC Standards

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the listed standards, in whole or in part, documented in a technical construction file.

EN50081-2EMC Generic emission standard, Part 2, Industrial environment.

EN50082-2EMC Generic immunity standard, Part 2, Industrial environment.

Low Voltage Directive:

FMIM meets Council Directive 73/23/EEC Low Voltage when the 24 Vdc power source to the 1701/10-power supply is approved to the Low Voltage Directive.

Hazardous Area Approvals

North America

Ex nA IIC T4

Class I, Zone 2

Class I, Div 2

Groups A, B, C, D

T4 @ -30°C = Ta = +70°C

Per drawing # 139255

Certification Number

CSA 1166985

European/ATEX

⟨Ex⟩   II 3G EEx nA [L] IIC T4

LCIE 00ATEX6016X

T4 @ -30°C = Ta = +70°C

⟨Ex⟩   II 1/3 G EEx nA[ia] ia IIC T4

LCIE 00ATEX6017X

T4 @ -30°C = Ta = +70°C

Brazil

Br-Ex nA [nL] IIC T4

MC, AEX-8304-X

T4 @ -30°C = Ta = +70°C

Ordering Information

FieldMonitor Management Interface Module

1701/22-AXX

A: Approvals

0 1	Division 2/Zone 2

Data Manager 2000 Software

2700/01-AXX

Data Acquisition Software

2700/03-AXX with Modification 145001-XX

Display Software with FMIM Incorporation

A: Type of purchase

0 1	Initial Purchase
0 2	Revision/Updates

145001-XX = 0 1 through 1 2

for the corresponding number of FMIMs

System 1Software

For System 1 option information go to **www.ge-energy.com/system1**

Ethernet Cable

Teflon®-jacketed, screened twisted-pair (ScTP) cable with one 9-pin D-sub and one RJ-45 connector suitable for 10Base-T Ethernet applications in industrial environments.

141976-AXXX-BXX

A: Length

0 1 0	10 foot cable (3.05 m)
0 2 5	25 foot cable (7.62 m)
0 5 0	50 foot cable (15.2 m)
1 0 0	100 foot cable (30.4 m)
2 5 0	250 foot cable (76.2 m)

B: Insulation

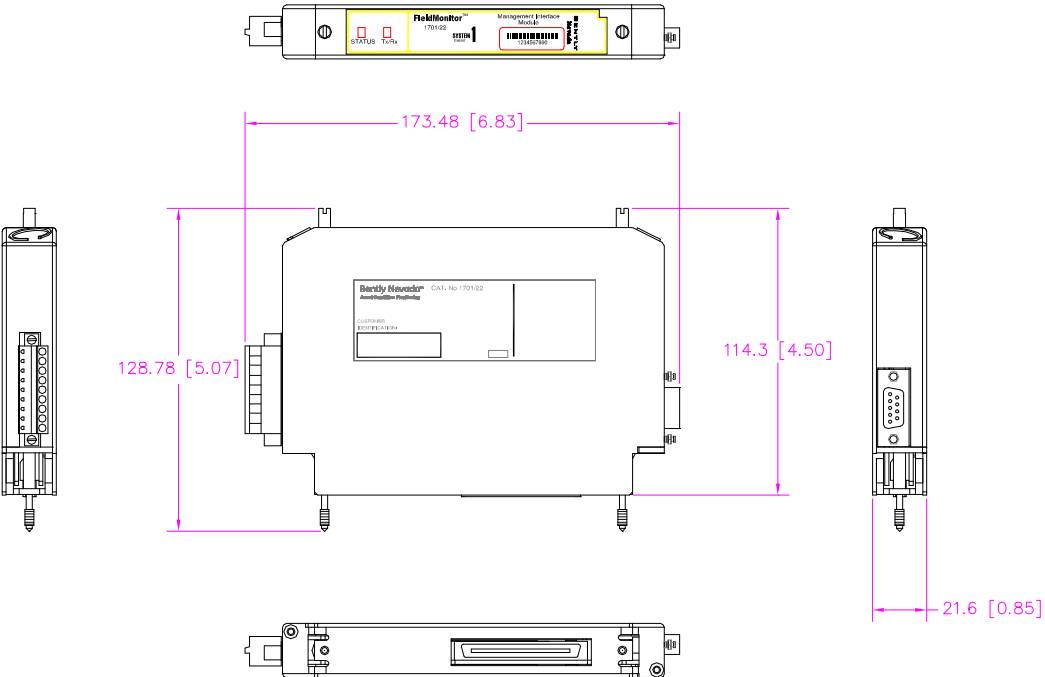|	
0 1	Teflon insulation

DC Powered Industrial Ethernet Hub

02200233

DIN rail mounted industrial-rated 4-port hub powered from +24 Vdc power source.

Figures and Tables

Note: All dimensions shown in millimetres (inches) unless noted otherwise.

1. Inter-module Keyphasor Connector
2. Status LEDs
3. DB-9 Ethernet Connector

Figure 1: Mechanical Outline of the FieldMonitor Management Interface Module

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