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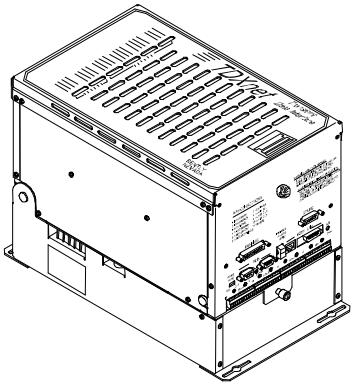
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Find the *GE / Bently Nevada 2155* at our website: *Click HERE*

# TDXnet*

## Bently Nevada* Asset Condition Monitoring



## Description

The TDXnet Communications Processor provides the interface between our compatible (see note) machinery protection systems and our on-line machinery management software. It continuously collects both steady state and startup/shutdown data from all connected channels in parallel, and offers significant improvements in both data collection features and data transmission (Ethernet or serial) over previous communications processors such as TDIX, TDM, and DDM.

Improved Startup/Shutdown Data Collection:

New Ethernet Link to Data Manager* 2000 computers

View Transient Plots during machine SU/SD

SU/SD data acquisition based on Keyphasor* input

Improved SDI communications with the DCS:

Additional Data Types - Data access now includes rpm values and status for all four TDXnet Keyphasor transducers as part of the available data

Use of RS485 with multi-drop functionality

New Register Allocation - Along with the traditional grouping data by channel, TDXnet now groups MODBUS register locations by proportional data values such as Direct, Gap, 1X Amplitude, 1X Phase, etc.

Maintaining same Data resolution of TDIX:

Quick Connection into compatible 3300, 3500, or 2201 Monitoring Systems

High Resolution Static, Orbit, and Spectrum Data

Immediate Recovery from Power Loss

Note:

TDXnet is directly compatible with 3500, 2201, and newer 3300 systems. Through the use of TDXconnX* other monitoring systems can also be used with TDXnet. Consult Specifications and Ordering Information (p/n 141552-01) for TDXconnX, or your local sales professional for more information

# Specifications

## Keyphasor Inputs

4 per unit. 60 to 60,000 rpm range.

Software configurable backup to real or simulated source.

## Startup/Coastdown Data

- SU/SD parameters changeable during program operation.
- Ability to view transient plots (e.g., Polar Plots, Bode Plots, Orbit, etc.) during a machine SU or SD without having to first upload the data.
- Initiation of SU/SD data collection based on detecting the Keyphasor sensor change in RPM eliminating the requirement for an externally wired contact closure.
- Two independent Startup/Shutdown buffers.
- One independent Delta-Time buffer.

## Data

- Delta time and delta RPM buffers each contain 320 vector and 32 waveform records.
- Vector records typically include Direct, Gap, 1X Amplitude, 1X Phase, 2X Amplitude, 2X Phase, and Not 1X for each dynamic monitor channel.
- Waveform records include both synchronous and asynchronous data.
- Option of selecting the 1X, 2X, and Not 1X data to be generated either from the monitoring system when available, or the communication processor.

## Waveform Sampling

- Waveforms are dc coupled to prevent low frequency roll off.
- Voltage inputs of ±25 Volts with up to 25 Volts peak-to-peak ac signal.
- Simultaneous Synchronous and Asynchronous data sampled during both SU/SD and steady state conditions.
- User configurable Synchronous data:
- 128 samples/rev for 8 revolutions
- 64 samples/rev for 16 revolutions
- 32 samples/rev for 32 revolutions
- Asynchronous data sampled to support a 400-line Spectrum at 20 kHz frequency span.
- Asynchronous data is anti-alias filtered.
- Waveform data is pre-triggered.

## Ethernet

- Host to TDXnet communication link is Ethernet, 10 Mbps, and conforms to IEEE802.3.
- TCP/IP protocol encapsulating our BN proprietary protocol.
- RJ-45 (telephone jack style) and AUI 15-pin connections.

## SDI Data

- Supports both Allen-Bradley and MODBUS protocols.
- An RS485 communication link which supports multidrop functionality.
- SDI support including 1X, 2X, high-resolution gap, and NOT 1X static data.
- Data access now includes rpm values and their status for all four TDXnet Keyphasor Inputs.
- Registers organized both by channel and proportional value type configurations.

## System

- Compatible with Data Manager 2000 Version 2.0 or later and Machine Condition Manager* 2000 version 1.0 or later.
- Support for 3500, 3300, and 2201 monitors.
- Support for TDIXconnX to accommodate legacy monitoring systems.
- Support for Rackmate IX for multiple 3300 monitor racks to a single CP.
- Operates on +90 to +240 Vac, 50 to 60 Hz without any changes. It also accepts +24Vdc with modification; contact your local sales professional.
- Power Consumption: 89 Watts Maximum. Current draw: 0.75 Amps typical @ 110 Vac and 0.38 Amps typical at 220 Vac.

## CE Mark Directives

EMC Directives:

Certificate of Conformity: 158809

EN50081-2

Radiated Emissions

EN55011, Class A

Conducted Emissions

EN55011, Class A

EN50082-2

Radiated Susceptibility

ENV50140

Radio Telephone

ENV50204

Conducted Susceptibility

ENV50141

Electrostatic Discharge

EN61000-4-2

Electrical Fast Transient

EN61000-4-4

Magnetic Field

EN61000-4-8

Power Supply Dip

EN61000-4-11

Low Voltage Directives:

Certificate of Conformity: 158809

EN61010-1

Safety Requirements

EN61000-3-2:1995

Harmonic Content

## Hazardous Area Approvals

CSA/NRTL/C:

Approval Option (01)

Class 1, Division 2

Groups A, B, C, D

T4 @ Ta = 65°C

Certification Number

CSA 150368 (LR 26744)

## Mechanical

Same footprint and bolt pattern as Transient Data Interface External (TDIX), Dynamic Data Interface External (DDIX), or Dynamic Data Manager (DDM).

Printed wiring assemblies shielded for protection while handling.

## Weight

TDXnet w/o samplers: 5.76 kg (12.7 lb.)

Sampler card: 0.24 kg (8.5 oz).

## Environmental

Operating Temperature:

0°C to +65°C (+32°F to +149°F)

Storage Temperature:

-40°C to +85°C (-40°F to +185°F)

Humidity:

0% to 95% non-condensing

# Ordering Information

## TDXnet Communication Processor

2155/00 - AXX-BXX-CXX-DXX- EXX-FXX-GXX-HXX-IXX-JXX

A: Number of Sampler Cards

| | |
|---|---|
| 00 | No Sampler Cards (no dynamic channels) |
| 01 | One Sampler Card (2 dynamic channels) |
| 02 | Two Sampler Cards (4 dynamic channels) |
| 03 | Three Sampler Cards (6 dynamic channels) |
| 04 | Four Sampler Cards (8 dynamic channels) |
| 05 | Five Sampler Cards (10 dynamic channels) |
| 06 | Six Sampler Cards (12 dynamic channels) |
| 07 | Seven Sampler Cards (14 dynamic channels) |
| 08 | Eight Sampler Cards (16 dynamic channels) |
| 09 | Nine Sampler Cards (18 dynamic channels) |
| 10 | Ten Sampler Cards (20 dynamic channels) |
| 11 | Eleven Sampler Cards (22 dynamic channels) |
| 12 | Twelve Sampler Cards (24 dynamic channels) |

B: Cable Options

| | |
|---|---|
| 00 | Cable not provided |
| 01 | 3300 Cables |
| 02 | 2201 Cables |
| 03 | 3500 Cables |
| 04 | TDIXconnX |

C Approvals

| | |
|---|---|
| 00 | No Approvals |
| 01 | CSA/NRTL/C |
| 02 | Not available |
| 03 | Not available |
| 04 | CE Agency Approvals |
| 05 | Multiple Approvals |

D: Power Supply

| | |
|---|---|
| 01 | +110/+220 ac |

E: Sampler Card Position - Slots 1 & 2

| | |
|---|---|
| 00 | No sampler card in Slots 1 or 2 |
| 10 | Sampler card in Slot 1 only |
| 01 | Sampler card in Slot 2 only |
| 11 | Sampler card in both Slots 1 & 2 |

F: Sampler Card Position - Slots 3 & 4

| | |
|---|---|
| 00 | No sampler card in Slots 3 or 4 |
| 10 | Sampler card in Slot 3 only |
| 01 | Sampler card in Slot 4 only |
| 11 | Sampler card in both Slots 3 & 4 |

G: Sampler Card Position - Slots 5 & 6

| | |
|---|---|
| 00 | No sampler card in Slots 5 or 6 |
| 10 | Sampler card in Slot 5 only |
| 01 | Sampler card in Slot 6 only |
| 11 | Sampler card in both Slots 5 & 6 |

H: Sampler Card Position - Slots 7 & 8

| | |
|---|---|
| 00 | No sampler card in Slots 7 or 8 |
| 10 | Sampler card in Slot 7 only |
| 01 | Sampler card in Slot 8 only |
| 11 | Sampler card in both Slots 7 & 8 |

I: Sampler Card Position - Slots 9 & 10

| | |
|---|---|
| 00 | No sampler card in Slots 9 or 10 |
| 10 | Sampler card in Slot 9 only |
| 01 | Sampler card in Slot 10 only |
| 11 | Sampler card in both Slots 9 & 10 |

J: Sampler Card Position - Slots 11 & 12

| | |
|---|---|
| 00 | No sampler card in Slots 11 or 12 |
| 10 | Sampler card in Slot 11 only |
| 01 | Sampler card in Slot 12 only |
| 11 | Sampler card in both Slots 11 & 12 |

## TDIX Retro Option

2155/50-AXX

| | |
|---|---|
| 01 | Early TDIX version (Hinged sampler card cover) retrofit |
| 02 | Late TDIX version (Non-hinged sampler card cover) retrofit |

# Accessories

| | |
|---|---|
| Interface Module | |
| 130914-01 | TDIXConnX |
| Ethernet Hardware | |
| Ethernet Media Transceivers | |
| 02200261 | 15-pin AUI male to 10Base-2 (thinnet) |

## Ethernet Hubs

**Note**:
The actual number of Ethernet ports, physical dimensions and manufacture of the hubs and switches may vary. Refer to relevant component description documents or contact your local sales representative for more information.

## Multi-port 10/100Base-TX Switch with backbone option

162419-AXX

A: Backbone option

| | |
|---|---|
| 00 | backbone |
| 01 | 100Base-FX (MT-RJ) Backbone |

## Multi-port Fiber Optic Switch with optional port types

142809-AXX

A: Port options

| | |
|---|---|
| 00 | 8 x 10Base-FL (ST) |
| 02 | 8 x 10Base-FL (ST) + 4 x 10/100Base-TX (RJ-45) |
| 03 | 8 x 10Base-FL (ST) + 4 x 10/100Base-TX (RJ-45) + 4 x 100Base-FX (MT-RJ) |
| 04 | 8 x 100Base-FX (MT-RJ) |
| 05 | 8 x 100Base-FX (MT-RJ) + 4 x 10/100Base-TX (RJ-45) |
| 06 | 12 x 100Base-FX (MT-RJ) + 4 x 10/100Base-TX (RJ-45) |
| 07 | 16 x 100Base-FX (MT-RJ) |

## Ethernet Cables:

## Standard 10BASE-T (Category 5) Cable with RJ-45 connectors (stranded patch cable)

02200230

6 ft (1.8 m) Length

02200231

10 ft (3.5 m) Length

02200232

25 ft (7.5 m) Length

## 10BASE-T Shielded Category 5 Cable with RJ-45 connectors (solid conductor)

138131-AXXX

A: Length (in feet) up to 320 feet

| | |
|---|---|
| 040 | 40 ft (12 m) |
| 050 | 50 ft (15 m) |
| 075 | 75 ft (22.5 m) |
| 100 | 100 ft (30.5 m) |
| 120 | 120 ft (36.6 m) |
| 150 | 150 ft (44.8 m) |
| 200 | 200 ft (61 m) |
| 250 | 250 ft (75 m) |
| 320 | 320 ft (97.5 m) |

## 10BASE-T Unshielded Category 5 Cable with RJ-45 connectors (solid conductor)

138171-AXXX

A: Lengths (in feet) up to 320 feet

| | |
|---|---|
| 050 | 50 ft (15 m) |
| 075 | 75 ft (22.5 m) |
| 100 | 100 ft (30.5 m) |
| 120 | 120 ft (36.6 m) |
| 150 | 150 ft (44.8 m) |
| 200 | 200 ft (61 m) |
| 250 | 250 ft (75 m) |

Note:
Standard lengths for 10BASE-T cabling are shown above. Additional lengths can be ordered through Custom Products and are available as shown below.

30 to 100 feet in 5-foot increments only
100 to 320 feet in 10-foot increments only

## 10BASE-2 Thinnet Cabling, PVC

103419-AXX

A: Lengths (in feet) up to 600 feet

| | |
|---|---|
| 01 | 20 ft (6.1 m) |
| 02 | 60 ft (18.3 m) |
| 03 | 100 ft (30.5 m) |
| 04 | 600 ft (183 m) |

10BASE-2 Accessories

02291081

Ethernet BNC Connector 50 Ω terminator

02291082

Ethernet BNC T-Connector

02291083

Ethernet BNC Barrel Connector

## Fiber-Optic Cable

137451-AXXXX

A: Length (in feet) up to 6500 feet (2000 metres) in length.
10 feet to 500 feet (order in 10 foot increments).
500 feet to 6500 feet (order in 100 foot increments).

SDI Communications Cable:

RS485 Cable for connection from Communication Processor to a Gateway device. Contact us for information regarding Lightning Protection.

## Cable between Communication Processors

131179-AXXXX-BXX-CXX

## SDI Host to Communication Processor

131209-AXXXX-BXX-CXX

Note:
Maximum continuous length is 150 metres (500 feet). For lengths longer than 500 feet, use one 131179 or 131209 with as many 131210, 500 feet extensions as necessary, up to 1200 metres (4000 feet).

A: Cable Length

| | |
|---|---|
| 0010 | 10 ft (3.05 m) |
| 0025 | 25 ft (7.5 m) |
| 0050 | 50 ft (15 m) |
| 0100 | 100 ft (30.5 m) |
| 0250 | 250 ft (75 m) |
| 0500 | 500 ft (150 m) |

B: Kit/Assembly

| | |
|---|---|
| 01 | Supplied as kit (for applications where the cable will be routed through conduit.) |
| 02 | Supplied as a complete assembly. |

C: Cable type

| | |
|---|---|
| 01 | PVC Insulated |
| 02 | Teflon Insulated |

Spare Sampler Cards

123447-01

TDXnet Sampler circuit board

Uninterruptible Power Supplies

143453-01

Uninterruptible Power Supply (UPS). 120 VAC Input / 120 VAC Output.

143453-02

Uninterruptible Power Supply (UPS). 230 VAC Input / 230 VAC Output.

143453-03

Extended External Battery Pack for the above Uninterruptible Power Supply units. (Requires either a 143453-01 or 143453-02, not a stand-alone unit.)

Rackmate IX

2150/11-02

Includes 2 each 5 foot 3300 static and dynamic cables

Spare Cables

02290163

TDXnet Communication Processor (CP) to 3300 Rack Static Data Cable

108186-01

TDXnet CP to 2201 Rack Static Data Cable

129386-01

TDXnet CP to 3500 Rack Static Data Cable

02290160

TDXnet CP to 3500, 3300, or 2201 Rack Dynamic Data Cable

Note:
These are 3.05 metres (10 feet) molded cables that connect the TDXnet to the 3500, 3300, or 2201 monitoring system. One set is included with the TDXnet when ordered. The required cables can be defined using the "B" option of the TDXnet ordering options.

Spare Power Supplies

162992-01

Power Supply Field Upgrade Kit

Note: This Field Upgrade Kit is for replacing the old style power supply with the new style power supply. Once this kit is in place, the new power supplies (02200625) can be ordered as spares.

02200625

Power Supply

Note: This is a new style spare power supply. It is only for use with new TDXnet/TDIX units and TDXnet/TDIX units with the 162992-01 upgrade already installed. Contact your Representative for more information.

TDXnet RS232/485 Converter Kit

139209-01

115 VAC Power Input

139209-02

230 VAC Power Input

## Dimensional Drawings

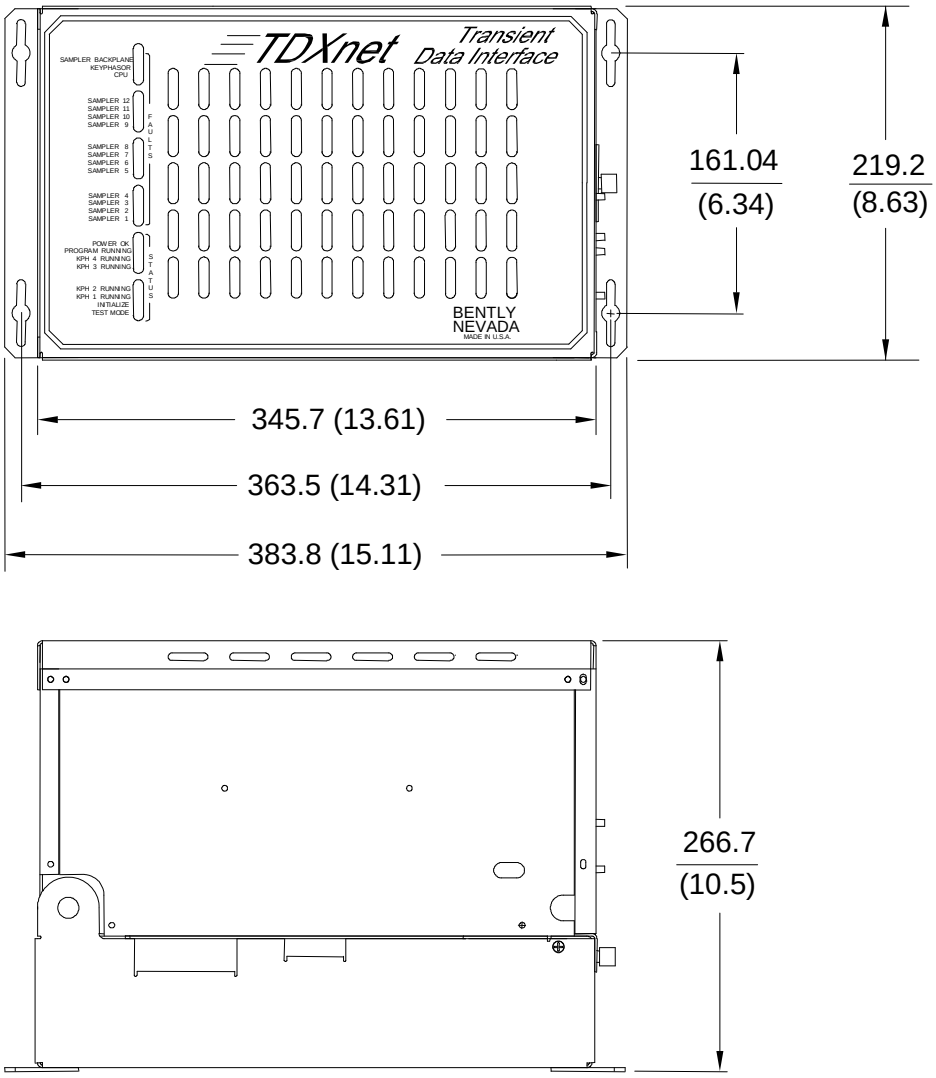



Figure 1: Transient Data Interface External (TDIX) dimensions
Dimensions are in millimetres (inches)

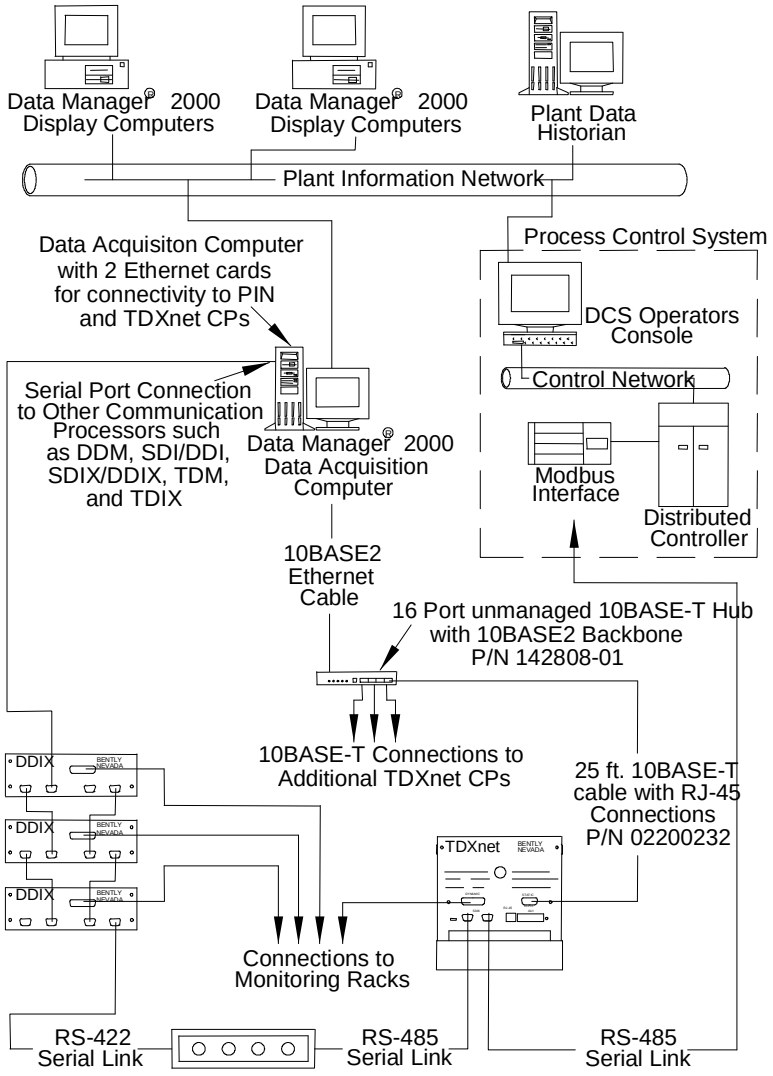



Figure 2: Transient Data Interface External (TDIX) clearances
Dimensions are in millimetres (inches)

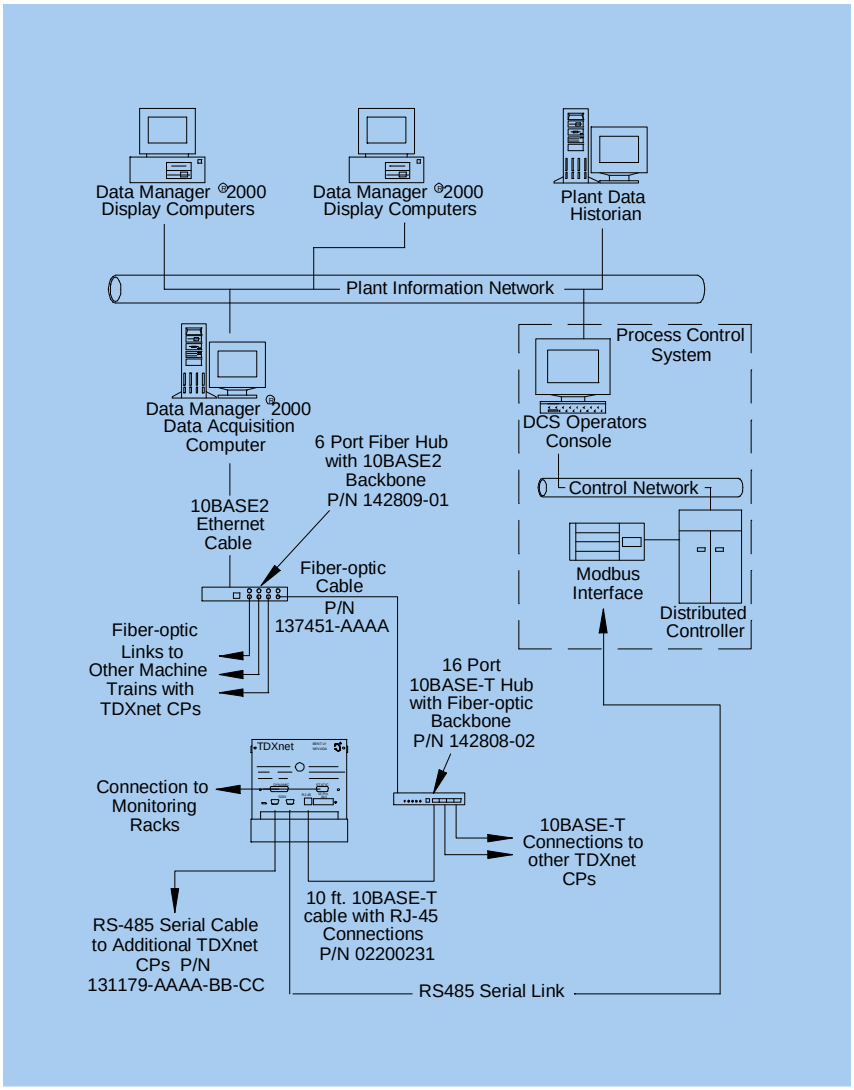



Figure 1: Fiber-optic Ethernet Links to Several Remote TDXnets.
Also demonstrated is the RS485 Connection to DCS

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