ADRE* Sxp/ 408 DSPi

Product Datasheet

Bently Nevada* Asset Condition Monitoring

Description

ADRE* Sxp Software and the 408 DSPi (Dynamic Signal Processing Instrument) make up a highly scalable system for multi-channel signal processing and data acquisition.
Unlike other general-purpose computer-based data acquisition systems, ADRE Sxp and the 408 DSPi are specifically designed for real-time highly parallel signal processing and presentation. This extremely versatile system incorporates the functionality of many types of instrumentation, such as oscilloscopes, spectrum analyzers, filters, signal conditioners, and digital recorders into a single platform. The system is designed specifically for secure corporate network environments, allowing it to operate remotely across a LAN/WAN, or store data in full "stand-alone" mode without an additional/external computer. Additional equipment is seldom, if ever, needed. The system's real-time display capability permits it to continuously display data independently of data being stored to permanent memory. For established ADRE system users, ADRE Sxp also supports all previous ADRE for Windows databases.

An ADRE Sxp data acquisition system consists of:

- 408 Dynamic Signal Processing Instrument(s)
- ADRE Sxp client software, ADRE Quick Configuration software
- A computer system capable of running ADRE Sxp software.

The 408 DSPi is fully portable or can be rack mounted allowing convenient operation in test stands, on-site, or at remote locations. The 408 DSPi's highly configurable design supports virtually all standard and non-standard input types including both dynamic transducer signals (such as those from proximity probes, velocity transducers, accelerometers, force hammers, dynamic pressure sensors), and static signals (such as process variables from transmitters and distributed control systems). For rotating machinery applications, users can provide a Keyphasor* or other speed input signal (such as that from a magnetic or optical transducer) to drive synchronous sampling and order tracking. For structural analysis needs, impact testing using force hammers is supported. The system also supports multiple triggering modes for automated data acquisition, allowing you to use the system as a data or event logger without an operator present.

The Client-Server architecture allows multiple software clients to operate and simultaneously view data from single/multiple 408 DSPi systems simultaneously, permitting users to independently view data in the fundamental measurement units of their choice. Software installation and configuration are quick and easy, allowing mass configuration of multiple channels with minimal user intervention. Configuration templates and

software further simplifies the process, allowing the user to install the software, produce a configuration, and begin capturing data in minutes.

408 DSPi Overview

Each 408 DSPi supports up to 4 sampling cards for up to 32 channels of data acquisition. The 408 DSPi base system uses internal clocks and simulated speed/Keyphasor signals to support both asynchronous and synchronous sampling for all channels. Speed Input/Trigger cards support up to 3 independent speed input channels for external speed inputs. Each Speed Input/Trigger card uses 1 available slot, and the 408 DSPi can use a maximum of 2 Speed Input/Trigger cards simultaneously providing up to 6 physical speed inputs and 6 simulated speed inputs. The user can assign any speed input (KPH) to any channel in a 408 DSPi. Most signal processing and sampling parameters can be changed "on-the-fly" without interrupting data collection.

The 408 DSPi architecture provides flexible hardware configuration. Users can insert sampling cards into the chassis as required. Slots 1 through 4 support all standard sampling cards. Slot 5 is intended specifically for the Digital Replay card as well as future option cards.

The standard Dynamic Sampling and Speed Input/Trigger cards provide full support for structural analysis and impact testing. Data can be analyzed natively or exported to 3rd party applications if desired.

The 408 DSPi front panel controls and displays basic functions and data. Users can directly initiate manual samples and triggering from the front panel without using ADRE Sxp software. The front panel LEDs indicates sampling and trigger status and activity. Users can download multiple sampling configurations to the 408 DSPi and later select them for use from the front panel.

8-Channel Dynamic Sampling Card (168905 – AA)

The 8-channel dynamic sampling card is an extremely powerful and flexible signal processing engine. Along with the analog front-end conditioning, the user can configure most transducer inputs, with positive or negative bias, while maintaining maximum signal input range. An array of DSP processors and 24-bit ADCs provide maximum resolution. Input signals can be either AC or DC coupled, and users can independently define upper and lower input voltage levels along with full-scale range and transducer scale factor.

The sampling card can provide a variety of data depending on the configuration and user needs. Each channel can provide multiple "static" variables including:

- direct amplitude,
- bandpass amplitude
- 1X and 2X Amplitude and Phase, and up to 4 additional user defined nX vectors including amplitude and phase
- average & instantaneous gap or bias voltages
- multiple speed values, and
- a date/time stamp.

In addition to the static data, each channel can provide up to 4 user-defined dynamic waveforms. Users can configure waveforms for simultaneous Synchronous and/or Asynchronous sampling, with different sampling rates and/or frequency spans. The sampling card supports up to 2 different synchronous sampling rates simultaneously. Time-Synchronous Averaging can also be enabled for all synchronous waveforms. In addition, the card can also sample and store the raw time-continuous data for each channel. All channels within the system are always sampled simultaneously, are synchronized, and are initiated based on a set of user defined events.

3-Ch Speed Input/Trigger Card (168906 – AA)

The 3-channel speed input/trigger card supports a variety of transducer inputs and signal conditioning needs including; proximity, magnetic, optical, and laser pickups. Transducer power for both optical pickup and ± 24Vdc proximity is also available if needed. For impact testing applications, the force hammer output can be connected directly to this card providing level triggering and full dynamic waveform capture. The card integrates a rich set of configurable analog signal conditioning tools including: input gain, voltage clamping, inversion, rising or falling edge trigger, auto/manual threshold, and hysteresis. The user can associate a programmable speed input (Keyphasor) multiplier/divider for each channel independently, define discrete values for events per revolution, or, a final ratio, whichever is more convenient. Each channel can have up to three separate "stages" of multiplier/divider ratios. Trigger/speed input

channels provide full dynamic sampling, complete with static and waveform data, available for real-time viewing and storage.

Each channel also includes a buffered output, allowing the user to select either raw, conditioned analog, or TTL outputs. The buffered outputs are independent of the signal being used for processing.

Digital Replay Card
(168907 – AA – BB - CC)

The Digital Replay Card provides simultaneous synchronous and asynchronous internal digital reprocessing and playback of all channels in the 408DSPi. The replay card maintains exceptional accuracy and precision in the signal reprocessing that far surpasses the capabilities of other equipment and reprocessing techniques. The digital replay card can play back raw data for *all* channels *simultaneously* including Keyphasor/speed and dynamic sampler inputs. Users can modify all sampling parameters on a KPH channel when replayed, and fully manage and re-condition the gain, inversion, clamping, and other characteristics of Keyphasor signals. This provides the ability to control triggering edges and thresholds as reprocessing and analysis requires. On standard dynamic channels, users can modify most sampling parameters. As an example, users may add or modify waveform assignments, variable generation, filtering options, frequency span, and Keyphasor assignments that did not exist in the original configuration reprocessing the data. Additionally, users may add or modify all sampling criteria and triggering parameters. Full scale range, coupling, and transducer type cannot be altered for standard dynamic channels. The Digital Replay card occupies Slot #5 of the 408 DSPi and does not reduce the number of channels available for data collection.

With the addition of Analog Output Replay Card the user may send up to 32 channels of recorded signals through data ports to auxiliary equipment. These signals are analog recreations of the original data observed by ADRE. The Replay Module can be ordered with or without the Analog Output Replay Card. Existing Replay Cards can be modified to include the Analog Output feature by sending the cards to Product Repair at Bently Nevada.

Transducer Power Supply Card
(168908 – AA – BB)

The transducer power supply card provides power for a wide variety of displacement, velocity, acceleration including ICP accels, force hammers, and other transducer types used in field and test stand applications. This card can simultaneously power up to 32 transducers in various combinations, and provides direct physical connections for up to 16 transducers, eight ± 24 Vdc transducer systems and eight constant current transducer systems. Field connection cable and adapter accessories accommodate additional transducer connections. In addition to ± 24 Vdc selections, the card provides ± positive and negative bias selections for constant current applications, all of which can be used simultaneously, to provide a highly flexible power source for most any need. Users can configure transducer power bias in blocks of four (4) directly from the card without the need for special tools, jumpers, or software.

Each output provides individual short-circuit protection, current regulation, and indicators for power status and voltage/current selection (complete card status is provided within ADRE Sxp client software). Also, this card can occupy a dedicated option slot and leave all transducer input slots available.

Field wiring cable accessories allow the user to conveniently connect both power and signals to the 408DSPi. These accessories support most voltage and constant current transducer applications without the need for additional bulky equipment. Field wiring accessories and cables must be ordered separately.

Networking Overview

The 408 DSPi is a secure network appliance that supports DHCP or fixed IP addressing based on your network environment needs. When installed on a LAN/WAN in DHCP mode, the DHCP server or router will assign an IP address to the 408 DSPi. When the user makes a direct connection between the 408 DSPi and client computer in DHCP mode, an IP address will be automatically assigned. The 408 DSPi also supports fixed IP addressing. The user can assign a fixed IP address on one Ethernet port while simultaneously running DHCP on the second Ethernet port. In some instances, primarily when navigating corporate security infrastructures, firewalls, or VPNs (Virtual Private Networks), specific router configuration may be necessary. Contact your local product support representative for details specific to your needs.

408 DSPi

Typical specifications are provided for a temperature of +25 °C ± 3 °C (+77 °F ± 5.4 °F) except where noted.

Data Storage Capacity

Internal - 480GB or 800GB

Communication:

Dual 1000/100Mb RJ45 Ethernet Ports
Protocol - TCP/IP
DHCP or Fixed IP addressing
LAN/WAN compatible

Internal Clock:

Battery-Backed Real-Time clock (RTC) accuracy is ± 2 seconds / month

Signal Conditioning - General

8 Channel Dynamic Sampling Card

Slot Position

Slots 1 through 4

24 Bit A/D converters

Input Impedance

Single Ended

742kΩ

Differential

1.484 MΩ between sig+ and sig- *4-20 mA* 511Ω

Inputs

Single-ended

8

Differential

4

4-20 mA

8

Maximum Signal Input Range:

-25 to 25 V

AC Configurable Full Scale Range

0.7 to 10 V

DC Configurable Full Scale Range

0.35 to 50 V

Status Indication

Boot, Selftest, OK/Not OK, Activity, A/D over range

Direct Measurement Accuracy

Filter values @ 0 db points unless specified otherwise.

Non-RMS, Non-Integrated Amplitude

AC Coupled – Hi Mode

1.6 Hz to 50 kHz
± 1.25% of Full Scale Range[2]

AC Coupled - Low Mode

N/A

DC Coupled – Hi Mode

1 Hz to 50 kHz
± 1% of Full Scale Range[2]
± .011V below 1 V pp

DC Coupled - Low Mode

0.167 Hz to 20 kHz

± 1% of Full Scale Range[2]
± .011V below 1 V pp

Non-Integrated, RMS Amplitude

Acceleration AC/DC Coupled Hi Mode

10 Hz to 50 kHz
± 1% of Full Scale Range[2]

Velocity

AC/DC Coupled Hi Mode

10 Hz to 50 kHz
± 1% of Full Scale Range[2]

AC Coupled Low Mode

N/A

Acceleration DC Coupled Low Mode

3 Hz to 50 kHz
± 1% of Full Scale Range[2]

Velocity DC Coupled Low Mode

3 Hz to 50 kHz
(-3db @ 3Hz)
± 1% of Full Scale Range[2]

Non-RMS Integrated, RMS Integrated Amplitude

Acceleration AC Coupled Hi Mode

10 Hz to 20 kHz
± 1% of Full Scale Range[2]

Velocity AC Coupled Hi Mode

3 Hz to 20 kHz
± 1% of Full Scale Range[2]

Direct Measurement Update Rates

Valid KPH or Simulated KPH present

0 to Peak / Peak to Peak values updated every 4 KPH periods.

Invalid KPH or No KPH present

High Mode – 2 sec sliding window
Low Mode – 12 sec sliding window
100ms update rate

Integrated Values

High Mode – 2 sec sliding window
Low Mode – 2 sec sliding window
100ms update rate

Bandpass Measurement Accuracy

Specifications are exclusive of filter corner settings and transition regions. Filter values specified @ -3 db points.

Non-RMS, Non-Integrated Amplitude

1 Hz to 50 kHz
± 1% of Full Scale Input[2]

Non-RMS Integrated, RMS Integrated Amplitude

1 Hz to 20 kHz
± 1% of Full Scale Input[2]

Bandpass Filter Selections (Typical)

Butterworth

2 Pole (-40 db/decade)
4 Pole (-80 db/decade)
6 Pole (-120 db/decade)
8 Pole (-160 db/decade)

Range

High Pass 1 Hz to 25.5kHz
Low Pass 10 Hz to 50kHz
Min separation between

HPF and LPF

2 Pole – 10.24 x HPF
4 Pole - 3.24 x HPF
6 Pole - 2.25 x HPF
8 Pole – 1.96 x HPF

Options

HPF < 10 Hz (2 Pole)
HPF ≥ 10 Hz (2, 4, 6, 8 Pole)
LPF ≥ 10 Hz (2, 4, 6, 8 Pole)

-3db Corner Frequencies

HPF & LPF - 1 Hz Increments,
-3db ± 5%

Bandpass Measurement Update Rates

Valid KPH or Simulated KPH present

0 to Peak / Peak to Peak values updated every 4 KPH periods.

Invalid KPH or No KPH present

100ms update rate

Integrated

2 sec sliding window

Non-Integrated

2 sec sliding window

Filtered Measurements

Filter Bandwidth

Selectable
1.2 cpm, 12 cpm, 120 cpm
(0.02 Hz, 0.2 Hz, 2 Hz)

User enabled Auto-switching tracking filters transition

120 cpm < to > 12 cpm @ 600 rpm
12 cpm < to > 1.2 cpm @ 60 rpm

Filter Settling Time to 95 / 99 % of final value

120 cpm < 0.477 / .796 sec
12 cpm < 4.77 / 7.96 sec
1.2 cpm < 47.7 / 79.6 sec

nX Amplitude and Phase Accuracy

1 to 120k rpm
± 1% of Full Scale Range[2]
± 3˚ of Input (Steady State)

nX Resolution and Range

0.01X Increments
0.01X to ((sample/rev)/2-1)X

Below Minimum Amplitude

DC Coupled

≤ 0.015 Vpp

AC Coupled

≤ 0.5% of full scale

Gap Voltage Measurements

Measurement Ranges

0 V to 24 Vdc
-24 V to 0 Vdc
-12 to 12 Vdc
-24 to 24 Vdc
Upper and Lower voltage range fully programmable between -25 to 25 Vdc

Amplitude

± 0.17% of FSR @ -25 to 25 V
± 0.26% of FSR @ 0 to ± 25 V
± 0.26% of FSR @ -12.5 to 12.5 V
(FSR = Full Scale Range)

Resolution

Measured 366.2 µV @ 24 V FSR

Response to 95%/99% of Final Value

Instantaneous Gap

0.95 / 1.59 sec.
-3db ± 5% @ 0.5 Hz

Average Gap

5.3 / 8.84 sec,
-3db ± 5% @ .09 Hz

Process Variable Measurements

Voltage Inputs

0 to 10 Vdc (Typical)
1 to 5 Vdc (Typical)

Measurement Range

-25 to 25 Vdc (Upper and Lower voltage range fully programmable)

Amplitude

± 0.12% of FSR @ 25V
± 0.30% of FSR @ 10V
± 0.75% of FSR @ 1-5V
(FSR = Full Scale Range)

Resolution

152.588 µV (0 to 10 Vdc)
61.035 µV (1 to 5 Vdc)

Response to 95%/99% of Final Value

0.95 / 1.59 sec.

Low-pass filter

-3db ± 5% @ 0.5 Hz

4 – 20 mA Input

Input Range

0 - 41.6 mA max

Amplitude

±1% of Full Scale Input

Resolution

244 nA / bit

Response to 95%/99% of Final Value

5.3 / 8.84 sec

Low-pass filter

-3db ± 5% @.09 Hz

Dynamic Waveform Data

Filtering associated with asynchronously sampled dynamic waveform data specific to anti-alias filters. Synchronously sampled waveform data is not anti- alias filtered.

Asynchronous Sampling Rates

128 to 128kHz (2.56 x Frequency Span, 50, 100, 250, 500, 1k, 2.5k, 5k, 10k, 25k, 50k Hz)

Anti-Alias

-80 db Minimum

AC Coupled

1 Hz to 50 kHz

Amplitude

±1% of Full Scale Range[2]

Phase

±3˚ of Input

DC Coupled

DC Hz to 50 kHz

Amplitude

±1% of Full Scale Range[2]

Phase

±3˚ of Input

Output

Up to 4 simultaneous asynchronous waveforms per channel

Synchronous Sampling Rates

Samples/rev (16, 32, 64, 128, 256, 360, 512, 720, 1024, 2048)
Synch sample rate X rpm ≤ 32 kHz

Hardware Generated Time Synchronous Averaging

Up to 2048 samples per waveform, up to 512 Averages i.e. (8 revs @ 256 samples/rev), (4 revs @ 512 samples/rev)

DC Frequency Support

937 rpm (15.62Hz) @ 2048x
1.87k rpm (31.25Hz) @ 1024x
2.66k rpm (44.4Hz) @ 720x
3.75k rpm (62.5Hz) @ 512x
5.3k rpm (88.8Hz) @ 360x
7.5k rpm (125Hz) @ 256x
15k rpm (250Hz) @ 128x
30k rpm (500Hz) @ 64x
60k rpm (1kHz) @ 32x
120k rpm (2kHz) @ 16x
(AC Frequency support from 1 Hz)

Output

Up to 2 simultaneous synchronous waveforms per channel

Hardware Generated Spectra

Spectral Lines

6400, 3200, 1600, 800, 400, 200, 100 lines, selectable. One asynchronous spectrum per channel.
Windowing provided on spectrum up to 800 lines, Rectangular, Hanning, Flat-Top, Exponential

Free Running Spectrum

1 per channel

Zoom Spectrum

1 asynchronous spectrum per channel.

Center Frequency

Configurable in 1 Hz increments

Zoom Factors

2, 5, 10, 20, 50

Spectral Lines

100, 200, 400, 800

Note[2] : Dynamic Sampling Card Amplitude vs. Frequency Cumulative Error

Frequency dependent amplitude and phase errors added to fixed range specifications.

Amplitude error vs. frequency

0 % from 0 to 10kHz
(± 4) % from 10kHz to 50kHz

Phase error vs. frequency

(-0.5) to (-2.8) deg from 0 to 5kHz
(-2.8) to (-6.6) deg from 5kHz to 10kHz

Keyphasor*/Speed Measurements:

3 Channel Speed Input (KPH) / Trigger Dynamic Sampling Card

Slot Position

Slots 1 through 4

Accuracy

1 – 120k rpm, (+/- 0.00915)% of Period Input, (+/- 11) rpm @ 120k rpm Input

Simulated Keyphasor Accuracy

1 – 120k rpm (+/- 0.02) % of Period Input
Note: Keyphasor card not required to provide simulated Keyphasor (up to 6 simulated Keyphasors)

Inputs

Total Inputs

3 speed inputs per card (single ended), maximum 2 cards per system.

Supported Transducers

Proximity, magnetic, or optical transducers. One "powered" optical input (Channel 3 only)

Proximity inputs

Input Range

-25 to +25 Vdc

Coupling

AC or DC

Input Impedance

128.9 kΩ

Buffered Transducer Outputs

3 channels, user selectable output

Output Types

Raw, Analog Conditioned, TTL
± 22V output maximum
20 µS min duty cycle for TTL output

Output Impedance

330Ω

Output Drive Capacitance

6100 pf (min)

Load Resistance

≥ 10k Ω

Output Protection

Short circuit protected

Raw Outputs Amplitude and Delay

AC Error

-0.91% to 0.42%

DC Error

± 60 mV

Signal Delay

0.66 µS (0.48 deg @ 2kHz)

Conditioned Outputs Amplitude and Delay

AC Error

-1.05% to 0.39%

DC Error

- 0.35 V to +60 mV

Signal Delay

2.0 µS (4.0 µS Optical) (1.4/2.8 deg @ 2kHz)

Transducer Power

-24 Vdc, 57.6 mA max (-22.77 Vdc max, -24.48 Vdc min)

+24 Vdc, 29 mA max (+24.48Vdc max, +23.13Vdc min)

+5 Vdc, 250 mA max (+5.2 Vdc max, +4.25 Vdc min, optical transducer power, Channel 3 only)

Direct Measurement (KPH) Accuracy

Filter values specified @ 0 db points

Non-RMS, Non - Integrated Amplitude

AC Coupled - High Mode

1.6 Hz to 20 kHz
± 1.25% of Full Scale Range[3]

AC Coupled - Low Mode

N/A

DC Coupled - High Mode

1 Hz to 20 kHz
± 1% of Full Scale Range[3]
± .011V below 1 V pp

DC Coupled - Low Mode

0.167 Hz to 20 kHz
± 1% of Full Scale Range[3]
± .011V below 1 V pp

Bandpass Measurement (KPH) Accuracy

Specifications are exclusive of filter corner settings and transition regions. Filter values for bandpass specified @ -3 db points

Non-RMS, Non - Integrated Amplitude

1 Hz to 20 kHz
± 1% of Full Scale Range[3]

Gap Voltage (KPH) Measurements

Measurement Range

0 to 25 Vdc
-25 to 0 Vdc
-12.5 to 12.5 Vdc
-25 to 25 Vdc

Amplitude

± 0.20% of FSR @ -25 to 25 V
± 0.28% of FSR @ 0 to ± 25 V
± 0.28% of FSR @ -12.5 to 12.5 V
(FSR = Full Scale Range)

Resolution

Measured 381.47 µV @ 25 V range

Response to 95%/99% of Final Value

Instantaneous Gap

0.95 / 1.59 sec.
-3db ± 5% @ 0.5 Hz

Average Gap

5.3 / 8.84 sec,
-3db ± 5% @ .09 Hz

Status

Types

Boot Status

Self-test
Over/Under Speed
Activity
Edge Pulse

Detection

Error detection indicated if change in rotative speed between consecutive Keyphasor pulses is greater than 25%, or shaft rotative speed is less than 1 rpm, or greater than 120k rpm

Keyphasor Index

While the shaft is stopped, the Keyphasor Index is used to assist with positioning a shaft relative to a reference position. Manual threshold must be selected for speeds below 1 rpm.

Triggering

Automatic or Manual Mode Selectable, positive or negative edge of signal input.

Speed/Dynamic Frequency Range

DC Coupled: DC to 20kHz
AC Coupled: 1Hz to 20kHz

Auto Threshold

1 rpm – 120k rpm (0.0167 Hz – 2kHz), min voltage required at low freq

Manual Threshold

1 rpm to 120k rpm (0.0167 Hz to 2kHz) -25 Vdc to 25 Vdc, 0.10 Vdc increments

Input Clamping

-25 to 25 Vdc, 0.01 V increments, positive and negative

Waveform Transformation

Inverting or non-inverting

Hysteresis

0.2 to 2.0 V, 0.2 V increments
0.2 to 1.0 V, 0.2 V increments (Optical)

AC Gain

1, 2, 5, 10

Minimum Input Duty Cycle

1.0 µS pulse

Maximum Trigger Error with Sine Wave Input

Input ≤ 1kHz: < 0.5 deg,
1kHz – 20 kHz: < 1 deg

Input Multiplier / Divider

3 stages per input channel,
8 digits pre decimal, 12 digits post decimal per stage, configurable ratio or real number in software.

Note[3] : Speed Input KPH Card Amplitude vs. Frequency Cumulative Error:

Frequency dependent amplitude and phase errors added to fixed range specifications.

Amplitude error vs. frequency

+ 1% to (-1.5) % from 0.1Hz to 20kHz

Phase error vs. frequency

(-1.5) to (-2.5) deg from 0 to 2kHz
(-2.5) to (-12) deg from 2kHz to 10kHz

Data Collection Trigger/Event

Triggers

Amplitude

Any variable, “or”, per channel. (amplitude, phase, nX, Direct, Bandpass, Gap, Process Variable)

Rpm

Upper and lower level, per speed input

Time

User-programmable, recurring, scheduled

External Contact

High or low voltage input , “normally open”, “normally closed” logic selectable in software

High Voltage

90 V to 240 V (AC or DC)
4 mA Maximum current
62 kΩ ± 2 %
(High voltage input to return)

Low Voltage

5 V to 30 V (AC or DC)
15 mA Maximum current
2.15 kΩ ± 2 %
(Low voltage input to return)

Sampling Events

Δrpm

1 rpm to 120k rpm, min 1 rpm increments

ΔTime

0.1 s to 999 hours, 0.1 s increments.
16 ms minimum event period for all sampling events.

Digital Replay KPH/Speed Input Measurements

Speed Input/KPH cards (168906-02) delivered prior to November 2006 require an update to work properly with the Digital Replay Card.

When in replay mode, there is no alteration to dynamic sampler data. The following apply to KPH measurements, in addition to standard operational KPH specifications except where noted:

Event Rate = Shaft rpm x Events/rev:

Event Rate	Rpm Error	Phase Error
1 to 6k	+/- < 1 rpm	+/- < 1 deg
6k to 30k	+/- 4 rpm	+/- < 1 deg
30k to 60k	+/- 7 rpm	+/- 1 deg
60k to 90k	+/- 20 rpm	+/- 1 deg
90k to 120k	+/- 40 rpm	+/- 2 deg
120k to 300k	N/A	+/- 3 deg (typ)
300k to 600k	N/A	+/- 6 deg (typ)
600k to 900k	N/A	+/- 8 deg (typ)
900k to 1200k	N/A	+/- 9 deg (typ)

Amplitude

Sine wave input up to 8 Vpp any full scale range.

Raw Outputs[4]

AC Error

-1.31% to 0.82%

DC Error

± 60 mV

Conditioned Outputs[4]

AC Error

-1.45% to 0.79%

DC Error

- 0.35 V to +60 mV

Note[4]**:Speed Input/KPH Card amplitude cumulative (total) error**
AC Accuracy Speed Input/KPH signal processing is independent from dynamic data produced by the standard dynamic sampling card. Reprocessing of data from the standard sampling card is therefore not subject to any additional signal processing errors.

Transducer Power Supply Card Slot Positions

Slots 1 through 5

Voltage Outputs

-24Vdc (-23.35Vdc to -24.48 Vdc)

Max Current

84.5 mA ± 4.5 mA

Short Circuit

55 mA ± 5mA per output, 8 outputs maximum

+24Vdc (+24.48Vdc to +23.34 Vdc)

Current When Shorted

52 mA ± 5mA per output, 4 outputs maximum

Current Outputs

(+) Bias

3.36 mA ± 0.3mA @ Load: 10 Ω to 6.5 kΩ per output, 4 outputs max

(-) Bias

3.30 mA ± 0.36mA @ Load: 10 Ω to 6.5 kΩ per output, 8 outputs max

Status Indication

Boot Status
OK Detection
Current Limit
Current Source - Bias (+/-)
Voltage Source - Bias (+/-)

Physical

Dimensions

408 DSPi (L x W x H)

36.1 x 41 x 10 cm (14.25 x 16 x 3.8 in)

Power Supply (L x W x H)

18.3 x 13.7 x 9.1 cm (7.2 x 5.4 x 3.6 in)

Weight

408 DSPi

9.5 kg (21 lbs) @ 32 channels

Power Supply

1.3 kg (3 lbs)

Construction

408 DSPi

Aluminum Chassis with cast aluminum front and rear panels.

Black Powder Coating – textured finish, indoor/outdoor use.

Environmentally sealed momentary tactile switches.

Bayonet locking external power connector

Environmental

Operating Temperature

408 DSPi and External Power Supply
0˚ C to +50˚ C (+32˚ F to +122˚ F)
Note: Rated specifications at fan inlets. Do not block fans during operation, un-obstructed airflow is required.

Storage Temperature

-30˚ C to +80˚ C (-22˚ F to +176˚ F)

Relative Humidity

0% to 95% non-condensing

Vibration

Operational

0.25G @ 5-100Hz

Non-operational

3G @ 5-100Hz

Shock

10G @ 2mS operational & non-operational

Environmental Considerations

The 408 DSPi is designed to meet a broad range of use cases and environments. Significant design measures have been implemented to provide a robust electrical and mechanical package. Shock isolation mounts are used internally on critical components and careful attention focused on reliability of the system including extensive shock, vibration, and temperature exposure. The robust shipping case is designed for transportation and shipment in the most rigorous environments.

The 408 DSPi is a measurement "instrument" and should be treated with the appropriate consideration. Exposure to "extreme" environments will have constraints. Direct exposure to condensing liquids, rain, sand, or other particulates that could impair ventilation are however, not appropriate. In scenarios that may exceed environmental specifications custom solutions can be created to meet specific needs. If you have any questions regarding an application, please contact your local Bently Nevada representative.

Input Power

External Power Supply

Input

90/264 Vac, 47/63 Hz auto sensing

Output

+32 Vdc ± 5% @ 10 A Max
+5 Vdc ± 3% @ 600 mA Max

Surge Protection

Up to 2kV Max

LED Indicators

AC Power ready
DC Output enabled
Fault Latch Detection

Faults

AC supply fault
Over/Under output voltage error
Over current detection
Thermal protection
(Faults are latching and require AC power cycle to reset)

Compliance and Certifications

EMC	**European Community Directives:** EMC Directive 2014/30/EU **Standards:** EN 61000-6-2 Immunity for Industrial Environments EN 61000-6-4 Emissions for Industrial Environments
Electrical Safety	**European Community Directives:** LV Directive 2014/35/EU **Standards:** EN 60950-1

Declaration of Conformity available online - http://www.GEmeasurement.com

NOTE

Signal Common is directly and permanently bonded to the chassis. The rear panel grounding switch no longer isolates the chassis from the signal common.

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.

408 DSPi

168679-AXX-BXX-CXX-DXX-EXX-FXX-GXX-HXX-IXX-JXX-KXX

All accessories are ordered as separate line items

A: Slot # 1 Option

- **0 0** Empty Slot
- **0 1** 8 Ch Dynamic Sampler Card
- **0 2** 3 Ch Speed Input (KPH) / Trigger Card
- **0 3** Transducer Power Supply Card

B: Slot # 2 Option

- **0 0** Empty Slot
- **0 1** 8 Ch Dynamic Sampler Card
- **0 2** 3 Ch Speed Input (KPH) / Trigger Card
- **0 3** Transducer Power Supply Card

C: Slot # 3 Option

- **0 0** Empty Slot
- **0 1** 8 Ch Dynamic Sampler Card
- **0 2** 3 Ch Speed Input (KPH) / Trigger Card
- **0 3** Transducer Power Supply Card

D: Slot # 4 Option

- **0 0** Empty Slot
- **0 1** 8 Ch Dynamic Sampler Card
- **0 2** 3 Ch Speed Input (KPH) / Trigger Card
- **0 3** Transducer Power Supply Card

E: Slot # 5 Option

- **0 0** Empty Slot
- **0 1** Digital Replay Card w/o Analog Output Card
- **0 2** Digital Replay Card w/ Analog Output Card
- **0 3** Transducer Power Supply Card

F: Power Supply Option

- **0 0** None
- **0 1** 90/264 Vac 47/63Hz (2US, 1 EU, 1 Br Power Cords Included)
- **0 3** AC Power Supply with US 10A/125V Power Cord
- **0 4** AC Power Supply with US 10A/250V Power Cord
- **0 5** AC Power Supply with Euro 10A 2 Wire Power Cord
- **0 6** AC Power Supply with Brazil 10A/250V Power Cord

G: Carry Case Option

- **0 0** None
- **0 1** Hard Shipping Case

H: Metrology Certification Option

- **0 0** None
- **0 1** All Cards

I: Rack Mount Kit Option

- **0 0** None
- **0 1** with 19 in Rack Mount Kit

J: Solid State Drive Option

- **0 1** 480 GB Solid State Drive
- **0 2** 800 GB Solid State Drive

K: Approvals

- **02** CE

What is included when ordering the 408 DSPi (168679):

1 Ethernet Cable – Cat5e with ferrite, 3 m (10 ft), required to meet CE certification.
Signal Input Cables are included with each Dynamic Sampler - quantity 8, and Speed Input (KPH) card - quantity 6, when ordered with the 408 DSPi (168679). Additional signal input cables (172068) can be ordered separately if needed.
Laser KPH transducer input adapter cable (169714-01) and Transducer Power Supply cables and accessories are ordered separately.

ADRE Sxp Software

4080/01-AXX-BXX-CXX-DXX-EXX-FXX-GXX

A: Version

- **0 1** Initial Order
- **9 8** Update

B: Full Function Client - License Quantity [2]

- **0 0** None
- **0 1** One (1) Client License
- **0 2** Two (2) Client Licenses
- **1 0** Ten (10) Client Licenses

C: Network Viewer Edition - License Quantity [2]

- **0 0** None
- **0 1** One (1) Client License
- **0 2** Two (2) Client Licenses
- **1 0** Ten (10) Client Licenses

D: Archive Viewer Edition - License Quantity

- **0 0** None
- **0 1** One (1) Client License
- **0 2** Two (2) Client Licenses
- **1 0** Ten (10) Client Licenses

E: Full Client - Media Quantity [1] [2]

- **0 0** None
- **0 1** One (1) CD-ROM
- **0 2** Two (2) CD-ROMs
- **1 0** Ten (10) CD-ROMs

F: Network Viewer Edition - Media Quantity [1] [2]

- **0 0** None
- **0 1** One (1) CD-ROM
- **0 2** Two (2) CD-ROMs
- **1 0** Ten (10) CD-ROMs

G: Archive Viewer Edition - Media Quantity [1]

- **0 0** None
- **0 1** One (1) CD-ROM
- **0 2** Two (2) CD-ROMs
- **1 0** Ten (10) CD-ROMs

[1] Media quantity must be either (1) or equal to license quantity

[2] Includes ADRE* Quick Configuration Software Media P/N 100M5072-01

ADRE Sxp Technical Support Plan

4080/20-AXX

A: Number of Years

- **0 1** One (1) Year – Single License
- **0 2** Two (2) Years - Single License
- **0 3** Three (3) Years - Single License
- **0 4** Four (4) Years - Single License
- **0 5** Five (5) Years - Single License

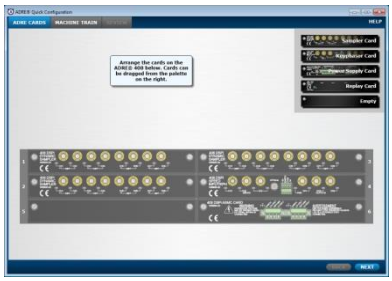
ADRE Quick Configuration Software

100M5072-01 Quick Configuration Software

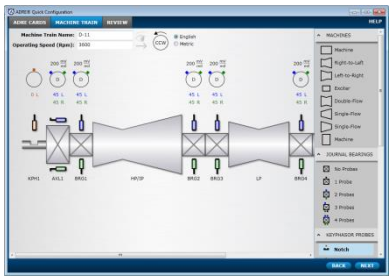
(For use with ADRE Sxp. 2.8 or later. Please contact your local sales representative for additional ordering information)

Setting up an ADRE is now as simple as 1, 2, 3 when using the ADRE Quick Configuration software.

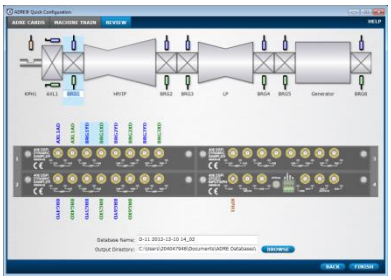
1. Arrange the cards.



2. Sketch the machine.



3. Plug it in.



The ADRE Quick Configuration software allows even the novice user to create an Sxp-ready database to configure ADRE and start receiving data within minutes. Bently best practices are integrated into the drag and drop menu to automatically create data collection parameters and a suite of plots to ensure the full power and productivity of the ADRE system is realized.
The newest to the most experienced ADRE user can take advantage of the ease, speed, and expertise of the ADRE Quick Configuration software so that more time is spent enhancing productivity utilizing the data, and less time worrying about manually configuring the system.

Bently BALANCE* Software

3030/01-AXX Multi-Plane Balancing Software
(For use with ADRE Sxp. Requires Bently Balance* Version 3.2 SP1 or later. Please contact your local sales representative for additional ordering information)

408 DSPi Accessories

(Accessories are ordered as separate line items.)

8-Channel Dynamic Sampler Card

168905-AXX

A: Approvals
0 2 CE

3-Channel Speed Input/KPH Trigger Card

168906-AXX

A: Approvals
0 2 CE

Requires appropriate adapter cable to connect optical transducer inputs.
Note: Speed Input/KPH cards (168906–02) delivered prior to November 2006 require an update to work properly with the Digital Replay Card.

Digital Replay Card

168907-AXX-BXX-CXX

A: Approvals
0 2 CE

B: Output Option
0 0 No output
0 1 With analog output

C: Cables (only applicable if **B** option = **0 1**)
0 0 Not Included
0 1 One 8 Channel Cable
0 2 Two 8 Channel Cables
0 3 Three 8 Channel Cables
0 4 Four 8 Channel Cables

Note: Speed Input/KPH cards (168906–02) delivered prior to November 2006 require an update to work properly with the Digital Replay Card.

Transducer Power Supply Card

168908-AXX-BXX

A: Approvals
0 2 CE

B: Output Accessory Option
0 0 None

Impact Hammer Kit

Impact_Hammer_Kit - AXX-BXX-CXX-DXX-EXX-FXX

Note: Transducer Power Supply Card recommended/required

A: 500lbf pk, 10mV/lbf, 0.3lbm (285570-01)
0 0 None
0 1 Hammer Included

B: 1000lbf pk, 5mV/lbf, 0.3lbm (285570-02)
0 0 None
0 1 Hammer Included

C: **0 0** None

D: Std Accelerometer Set (200350, 100mV/g ±50g)
0 0 None
0 4 Set of 4
0 8 Set of 8

E: **0 0** None
F: **0 0** None

What is included when ordering the Impact Hammer Kit:

The Impact Hammer Kit can be configured with various types of impact hammers and accelerometers. The kit includes a case suitable to fit all components.

Each hammer includes an assortment of tips and the necessary cable for connection to the 408DSPi.

Accelerometers can be ordered in sets of 4 or 8, and each one will include the necessary cable for connection to the 408 DSPi. See Figure 4.

Each component of the Impact Hammer Kit can also be ordered individually if needed, i.e. cables, etc.

Please refer to the datasheet for the Impact Hammer Kit for details.

Note: *The impact hammers and accels require a constant current power source. If the end user does not already have a method to power these devices, a Transducer Power Supply Card (168908-AA-BB) will be required.*

Additional Accessories (Accessories are ordered as separate line items)

172068 Signal Input Cable - SMA to BNC, 3 m (10 ft) required for 168905 – 02 (or /01), and 168906 – 02 (or /01).

173887 SMA Push-On Adapter, for SMA to BNC cable 172068. Allows SMA cable connector to be pushed onto signal input connector for convenience.

286241 BNC male to SMA female Adapter

174466 Ethernet Cable – Cat5e with ferrite, 3 m (10 ft). Required to meet CE certification. (quantity 1 included with 408DSPi)

169633 408 DSPi Hard Shipping Case

169337 408 DSPi External Power Supply 90/264 Vac 47/63 Hz

169347 - 01 External Power Supply to 408DSPi Extension Cable, 1.8 m (6 ft). For use with 169337. Using this cable provides additional cable length for a total of ~ 3 m (10 ft). Convenient for rack mount applications.

169234 - 01 408 DSPi 19 in Rack Mount Kit

123135 Velomitor Power Module Kit – Provides power and connects up to four Velomitor transducers.

169714 - 01 Keyphasor input adapter cable (0.5m). Connects ***laser transducer*** kits to KPH card 168906 – 02 (or /01). See Figure 3.

166812 - 01 Laser transducer kit with 2m cable. Includes transducer and extension cable. Requires adapter cable 169714 - 01 to connect to KPH card 168906 – 02 (or /01). See Figure 3.

166813 - 01 Laser transducer kit with 5m cable Includes transducer and extension cable. Requires adapter cable 169714 - 01 to connect to KPH card 168906 - 02 (or /01). See Figure 3.

284814-020 20m Laser transducer extension cable

02290050 Reflective tape roll

174968 Fan vent cover update/replacement kit

176472 European AC Power Cord 250V 2.5m

178775 - 01 408DSPi Transducer Power Supply Card Standard Field Wiring Harness. See Figure 5 and Figure 6.

178762 - 01 408DSPi Transducer Power Supply Card Modular Field Wiring Harness

	(requires 178763-01) See Figure 5 and Figure 7.
178763 - 01	408DSPi Transducer Power Supply Card Modular Wiring Adapter. See Figure 5.
178897 - 01	408DSPi Transducer Power Supply Card Field Wiring Terminal Kit. See Figure 5.
177067 - 01	ADRE 408 Protective Cover Assembly
287743	ADRE 408 Analog Output to 8X BNC Cable
289043 - 01	ADRE 408 Analog Output Rebuild Kit (only for existing Replay Cards)
173548 - 01	ADRE 408 Blank Panel
172070	Panel screw 4-40 Thread, ¾" Length

Transducer Power Supply Cable Frequently Asked Questions:

1. What do I need to order if I want to power 1 to 4 positive biased Accelerometers/Velomitor (2-wire) constant current transducers.
   Answer: 178775-01 and 178897-01, Transducer connection A to COM and B to SIG on 178897-01; connect 178897-01 to 178775-01; connect 178775-01 to input channels 5 through 8 on 168908 which is provided with the Transducer Power Supply; set the Constant Current switch in the (pos +) position.
2. What do I need to order if I want to power 5 to 8 positive biased Accelerometers/Velomitor (2-wire) constant current transducers.
   Answer: This would require an additional Transducer Power Supply 168908-02 and 2 set of 178775-01 and 178897-01, Transducer connection will be the same as Question #1.
3. What do I need to order if I want to power 1 to 8 negative biased Accelerometers/Velomitor (2-wire) constant current transducers.
   Answer: 178775-01 and 178897-01 (both are 4 channel connectors so a set of 2 would be required for 5 to 8), Transducer connection B to COM and A to SIG on 178897-01; connect 178897-01 to 178775-01; connect 178775-01 to 168908 which is provided with the Transducer Power Supply; set the Constant Current switch in the (neg -) position.
4. What do I need to order if I want to power more than 9 to 16 negative biased Accelerometers/Velomitor (2-wire) constant current transducers.
   Answer: This would require an additional Transducer Power Supply 168908-02 and up to 4 set of 178775-01 and 178897-01 (both connectors are capable of having 4 channels), Transducer connection will be the same as Question #3.
5. What do I need to order if I want to power 1 to 8 negative bias 3-wire transducers (Accelerometers, Velomitors, or Proximitor Probe).
   Answer: 178762-01 and 178897-01 (2 each would be required if channel count was greater than 4) and 178763-01; Transducer connection PWR, COM and SIG on 178897-01; connect 178897-01 to 178762-01; connect individual channel on 178762-01 to individual channels on 178763-01; individual channels can use either the 1st 4 connector positions with the Voltage Source switch in the (neg-) position or use the 2nd 4 connector positions. Daisy chaining is possible up to 3 per channel.
6. What do I need to order if I want to power 9 to 24 negative bias 3-wire transducers (Accelerometers, Velomitors, or Proximitor Probe).
   Answer: 178762-01 and 178897-01 (each cable can take 4 channels so order accordingly), 178763-01 use all 8 connector positions and connect in the same manner in Question #5. You can daisy chain up to 3 channels per 178763-01 channel.
7. What do I need to order if I want to power 1 to 4 positive bias 3-wire transducers (Accelerometers, Velomitors, or Proximitor Probe).
   Answer: 178762-01, 178763-01, 178897-01; Transducer connection PWR, COM and SIG on 178897-01; connect 178897-01 to 178762-01; connect individual channel on 178762-01 to individual channels on 178763-01 only using channel inputs 1-4; Voltage Source switch in the (pos +) position.

8. What do I need to order if I want to power 5 to 12 positive bias 3-wire transducers (Accelerometers, Velomitors, or Proximitor Probe.)
   Answer: (2 or 3) 178762-01, (2 or 3) 178897-01 01 (each cable can take 4 channels so order accordingly), 178763-01, use only the first 4 connector positions on 178763-01 and connect in the same manner in Question #7. You can daisy chain up to 3 channels per 178763-01 input.
9. What do I need to order if I want to power 13 to 24 positive bias 3-wire transducers (Accelerometers, Velomitors, or Proximitor Probe.)
   Answer: This would require an additional Transducer Power Supply 168908-02 and (4 to 6) 178762-01, (4 to 6) 178897-01 01 (each cable can take 4 channels so order accordingly, 178763-01, use only the first 4 connector positions on 178763-01 and connect in the same manner in Question #8. You can daisy chain up to 3 channels per 178763-01 input.

Minimum Computer Requirements

ADRE Sxp software will run on most computer systems, desktop or notebook, provided that the systems meet minimum specifications. This datasheet provides recommended computer requirements; inadequate specification will impact software operation and system performance and the ability for the system to achieve maximum specifications. You must follow the "recommended computer specifications" to realize the full system performance.

Minimum Computer Specifications

- 2.4 Ghz or faster, Xeon
- 1.8Ghz or faster, Dual Core (notebooks)
- 2 GB RAM
- 160-250 GB HDD
- 1000/100 MB Ethernet
- SXGA 128MB VRAM

ADRE Sxp Notebook Computer

169849 High Performance Notebook Computer

This computer does not have an external parallel port. You can also use this computer with ADRE for Windows® software but it is not compatible with the 208DAIU.

- 2.60 Ghz Intel® Core Processor
- 16 GB DDR4-2133 (2x 8GB)
- 1TB 5400 rpm SATA 3
- USB 2.0 (or higher)
- 15.6" LED-backlit FHD + 1920x1080, 512MB VRAM
- External HP DVD/RW Drive Included
- 720p HD webcam
- Windows® 10 Professional 64-bit OS
- Notebook Carry Case
- SanDisk Cruzer 32 GB USB 2.0 Flash Drive

Computer Peripherals

Users should evaluate the selection of additional external peripherals on a case-by-case basis. User needs can be very different and therefore we do not recommend generic solutions. We can provide peripherals such as printers, external hard drives, monitors, or other devices that best meet your needs. Please provide your sales representative with specific requirements.

Operating System Requirements & Support

ADRE Sxp software is designed to run and fully tested on Microsoft® Windows® 7 and Windows® 8. ADRE Sxp software can be installed on Microsoft Windows Vista.® ADRE Sxp software cannot be installed on earlier versions of Microsoft ®Windows ® operating systems such as Windows® 95/98/NT/XP.

Networking Requirements

ADRE Sxp software requires an available Ethernet port with TCP/IP protocol support to communicate with the 408 DSPi. A 1000 MB (GB) Ethernet port is required for the 408 DSPi to meet full performance specifications. Under typical conditions with only one or two clients accessing the 408 DSPi, 100MB Ethernet will provide excellent performance.

Bandwidth sharing on any network, depending on traffic, is always a consideration and will affect network performance. Ensure that all networking hardware is installed and configured per network administrator's specifications.

Database Access and Storage

The 408 DSPi can store 292-600 GB of data internally. For applications that may need significantly more storage capacity, an external rack mounted drive array can also be added. Permanent installations, test stands, or very long term storage of raw streamed data can easily be supported with an external drive array.

You can use the ADRE Sxp software to view all data on the 408 DSPi, thereby minimizing the need to move large datasets over the network. Users can move entire databases or just the portion they need to a client computer. Because moving large databases over a network can consume significant bandwidth and affect network performance we recommend that you use a dedicated or high bandwidth network or a local (direct) connection between the 408 DSPi and the ADRE Sxp client computer.

Data/Database Export

All versions of ADRE Sxp software provide the ability to export all data to a generic delimited spreadsheet format. Users can select specific data types, static (by variable type), and/or dynamic waveforms. Exported data can then be imported into many 3rd party applications for different types of analysis and/or presentation needs.

Data/Database Import

The latest versions (3.1 greater) of the ADRE Sxp software provide the ability to import vector and waveform data from a generic delimited spreadsheet format. Users can select a direct static type, and asynchronous waveforms. Imported data can be presented in the ADRE Sxp software for different types of analysis and/or presentation needs.

ADRE for Windows

ADRE Sxp software provides complete support for existing ADRE for Windows databases. This allows users to continue using existing ADRE for Windows systems as needed while sharing data with those running ADRE Sxp software. Although ADRE Sxp does not communicate directly with the 208 DAIU, ADRE for Windows software can run on the same computer as ADRE Sxp. Contact your local technical support representative for details specific to your needs.

Network and Archive Viewer Edition Software

There are two "Viewer Edition" options for ADRE Sxp that are specifically designed to meet use case scenarios that do not require active control or configuration of a 408 DSPi. All versions of ADRE Sxp can read all ADRE for Windows databases.

Network Viewer Edition - The Network Viewer allows a user to "connect to a 408" and view ***live data*** or any archived data on the 408. Users need this if they wish to view live data, participate in a live test, etc. The network viewer can also display all archived data, either locally, or on the 408. This option is intended for applications that require remote participation in data collection or viewing of live data, as well as local viewing of archive data.

Archive Viewer Edition – The Archive Viewer software is intended for situations when a user requires support from other personnel, typically from a corporate support team or consultant. In such cases, support personnel will not actually be configuring or collecting live data from the 408. Once a user has archived and moved data from the 408, the Archive Viewer provides all viewing features and data manipulation capability. The Archive Viewer allows users to open databases only after they have been archived and moved to another computer or placed on storage media. The Archive Viewer is not able to connect to a 408 at all.

Display Plot / Formats

The following plots can be selected from stored data. Users can configure the display to show only the applicable plots for any given application package.

- Current Values
- Tabular List
- Orbit / Timebase (w/ superposition of overlay)
- Orbit (w/ superposition of overlay)

ADRE Sxp Client Versions	Full Function	Network Viewer	Archive Viewer
Functionality			
View historical data on local computer	✓	✓	✓
View historical data stored on network server/drive	✓	✓	✓
Import and view ADRE for Windows data	✓	✓	✓
Configure, save, and view plots and plot sessions	✓	✓	✓
Export Static and Dynamic Data	✓	✓	✓
Build 408 Configurations	✓	✓	✓
View Configurations	✓	✓	✓
Connect to 408	✓	✓	
Upload Configurations to 408	✓	✓	
View Real-time Data on 408	✓	✓	
Download data from 408 to local computer	✓	✓	
View Network Settings on 408	✓	✓	
Quick Configuration Software	✓	✓	
408DSPi Control & Operation	✓		
Enter & Exit Store Enable	✓		
Manual Sample	✓		
Control Triggering	✓		
Modify and Save Configuration Changes	✓		
On-the-fly Configuration Changes	✓		
Set Active Database/Configuration	✓		
Modify System Properties	✓		
Update/Service 408	✓		
408 Diagnostics	✓		
Configure Network Settings	✓		

- Timebase (w/ superposition of overlay)
- Continuous Raw Timebase (w/multi decimation)
- Bode (w/ *Forward & Reverse Vector transforms*, coming soon)
- Polar (w/ *Forward & Reverse Vector transforms*)
- Shaft Centerline (Average and *Instantaneous* position & *Orbit Overlay*)
- X vs. Y
- Trend / Multivariable Trend
- Spectrum / Full Spectrum
- Waterfall / Full Waterfall (w/ Campbell format)
- Cascade / Full Cascade (w/ Campbell format)
- Structural Analysis (Timebase w/Rectangular and Exponential Windows)
- Structural Analysis Results (w/Transfer Function, Coherence, Auto/Cross Spectrum)
- System Event List

Multi-Plane Balancing Software

Bently BALANCE* software (3030/01) is designed specifically to integrate with your ADRE system. ADRE Sxp databases can be imported directly into Bently BALANCE 3.2 SP1 (and later) providing analysis and a comprehensive solution for your most challenging balancing needs. You can also import/export data directly from/to spreadsheets into Bently BALANCE, adding great flexibility to your balancing program. Bently BALANCE includes powerful optimization tools, multiple sets of influence vectors, and multiple “what-if” solutions, all while viewing graphical results on plots and weight maps. Bently BALANCE is a powerful part of your total diagnostic and maintenance program. Contact your local sales representative for more details.

Software Licensing

ADRE Sxp software is available as a single “computer” license. A separate license is required for each installation of this product on a different computer. Contact your local sales or service representative to purchase or discuss “site” or “enterprise” licensing requirements.

Software Technical Support Agreement

The Software Technical Support Agreement (TSA) allows you to contact our Product Service department for assistance at any time during the selected period of coverage. The support agreement period begins with your initial request for assistance, first software update, or three months after your order, whichever comes first. In addition to e-mail, fax, and telephone support, the Support Agreement provides free software updates as well as updates via the Internet. Your Technical Support Agreement ensures that you have access to the most current version of software with all the latest enhancements. Technical support plans are available for single and enterprise wide installation of our software products. Contact your local sales representative for details specific to your needs.

Registration for ADRE Sxp Technical Support

Registration of the ADRE Sxp software product is the only way to activate your Technical Support Agreement. Please contact your local Technical Support representative or visit us online for details specific to product registration.

Training Programs

Training is essential to ensure users are able to realize full value from their tools in the most efficient manner. Our technical training group can provide training to meet your needs. Training specific to ADRE Sxp and the 408 DSPi can be provided at your facility or at one of many Training Centers located around the world. Contact your local sales representative for details specific to your needs.

Documentation (can be ordered separately)

176559-01 ADRE Quick Start Guide

172179-01 ADRE Sxp / 408 DSPi Datasheet

Graphs and Figures

Figure 1: ADRE Sxp/408 DSPi Front View

Figure 2: ADRE Sxp/408 DSPi Rear View

Figure 3: 408 DSPi with Optical KPH and Laser Tachometer speed input transducers.

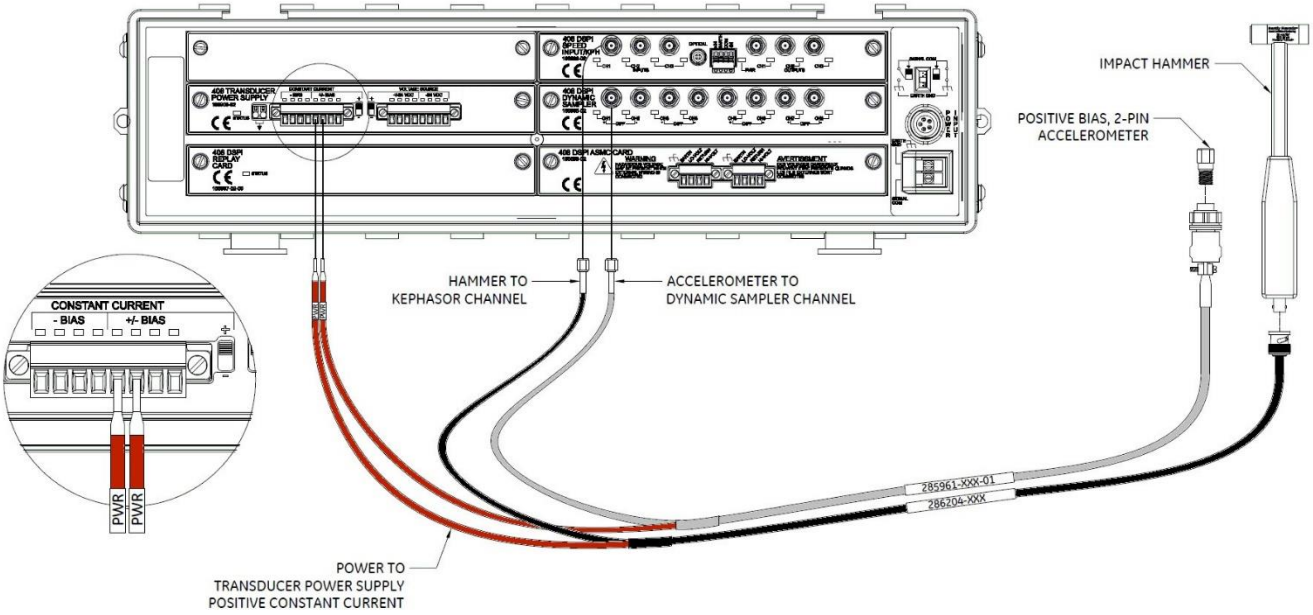
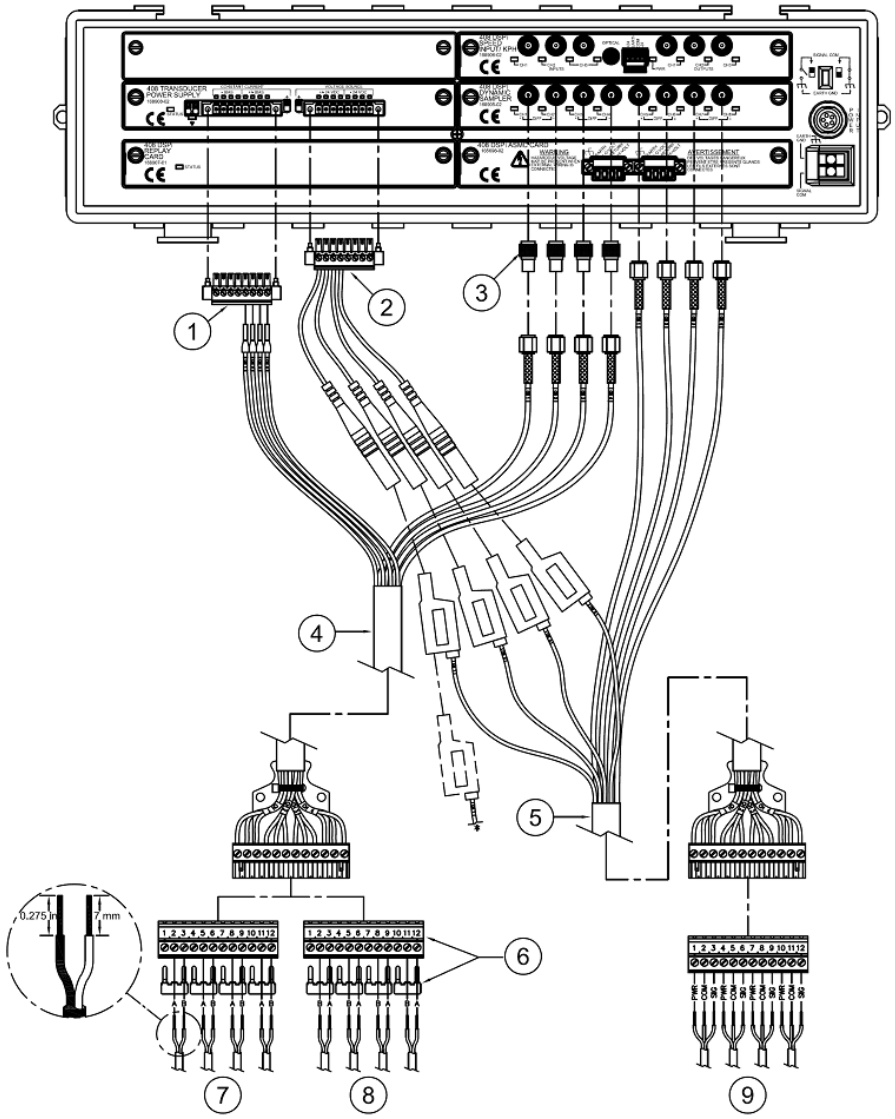
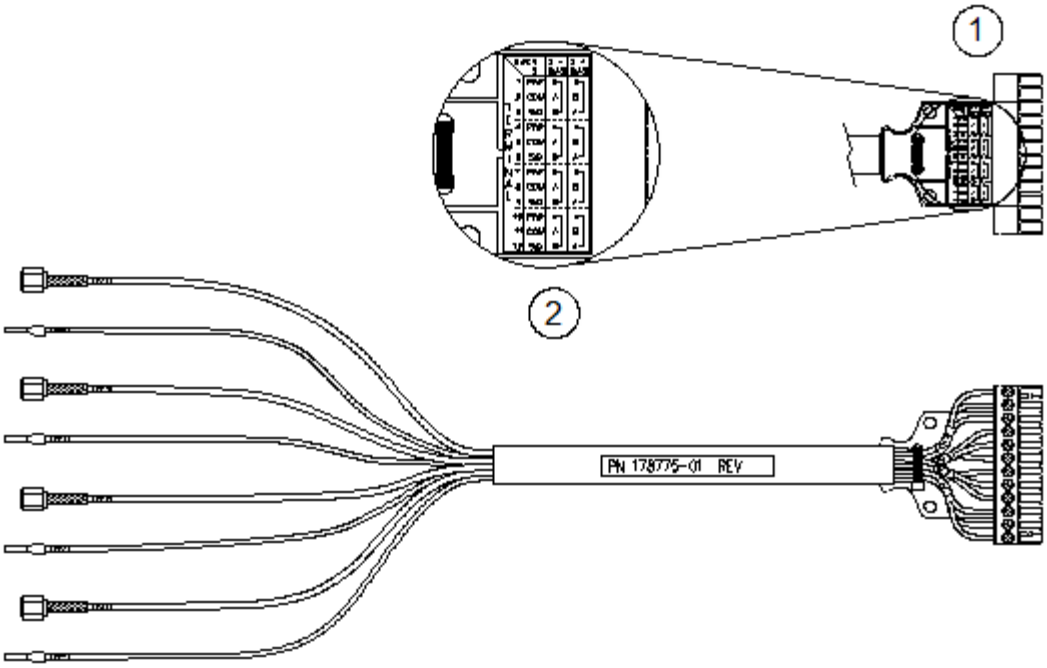


Figure 4: 408 DSPi with Impact Hammer and Accelerometer.



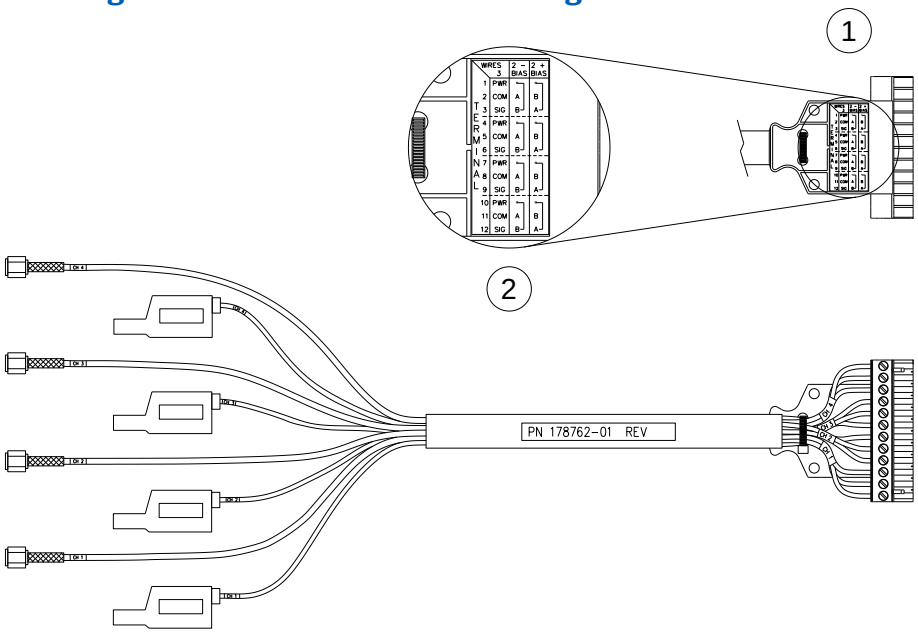
1. Standard terminal plug (included with 168908)
2. Modular wiring adapter (P/N 178763-01). Required for 178762-01.
3. SMA push-on quick-connect adapter (P/N 173887).
4. 4-connection standard wiring harness for 2- or 3-wire transducers (P/N 178775-01). See Figure 6 for detail.
5. 4-connection modular wiring harness for 2- or 3-wire transducers (P/N 178762-01). See Figure 7 for detail. **Note:** Modular wiring harness can be stacked only with 3-wire voltage powered connections (will not work with constant current transducers).
6. Field wiring terminal kit (one 12-position terminal and jumpers P/N 178897-01).
7. Field wiring for 2-wire constant current transducers with negative bias.
8. Field wiring for 2-wire constant current transducers with positive bias.
9. Field wiring for 3-wire positive or negative voltage powered transducers.

Figure 5: Field Wiring Cables for Transducer Power and Signal Input



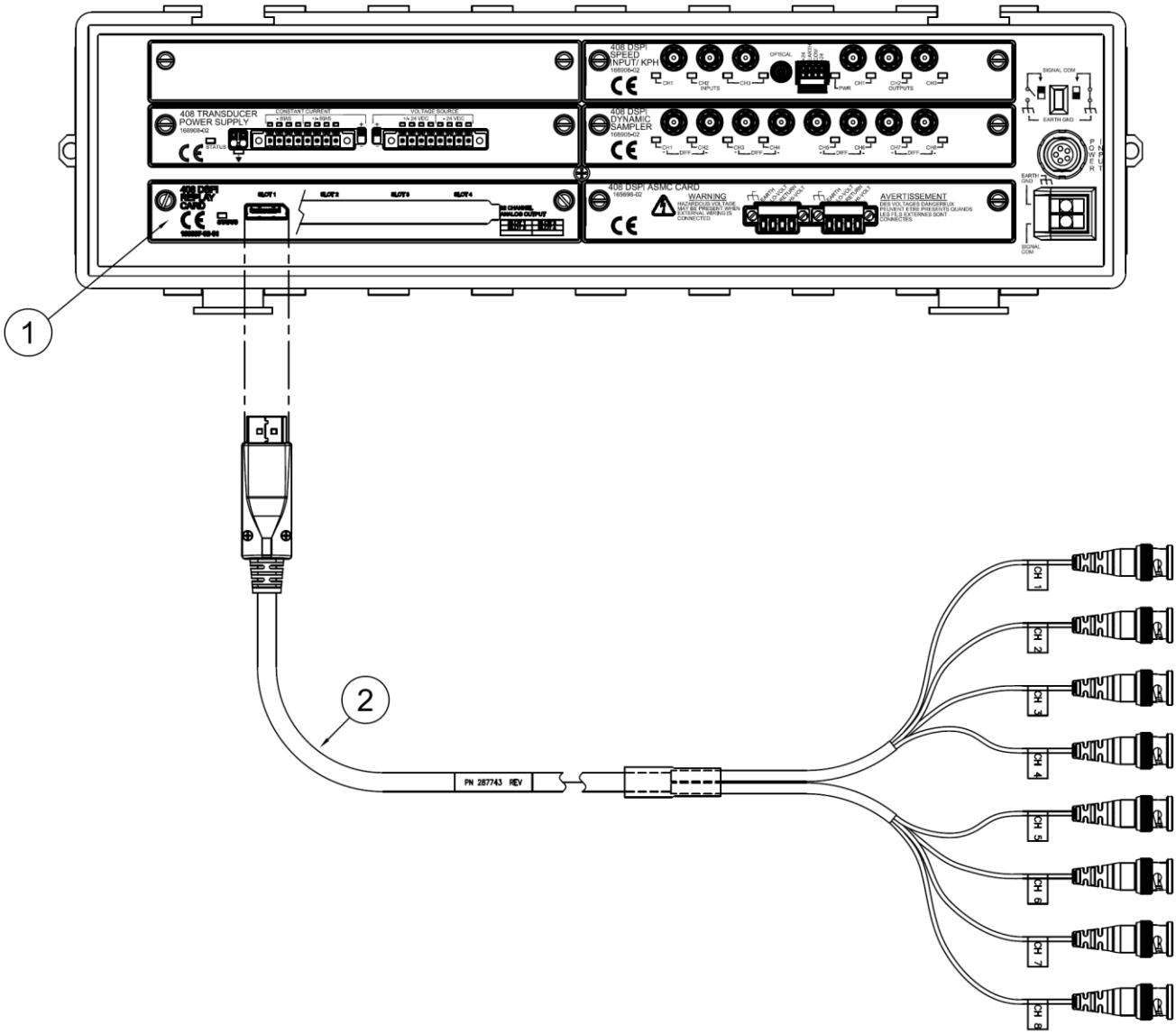
1. Reverse side of connector.
2. Detail of wiring legend label.

Figure 6: Detail of Standard Wiring Harness 178775-01



1. Reverse side of connector.
2. Detail of wiring legend label.

Figure 7: Detail of Modular Wiring Harness 178762-01



1. ADRE 408 Replay Module with Analog Outputs
2. ADRE 408 Analog Output to 8X BNC Cable

Figure 8: 408 DSPi with Replay Module and Analog Output to 8X BNC Cable.

1631 Bently Parkway South, Minden, Nevada USA 89423
Phone: 775.782.3611 www.GEmeasurement.com