DATAQ INSTRUMENTS

The way PC-based instrumentation should be

DI-725/E

Analog Channel Expander

User's Manual

Manual Revision E

Software Release Level 1

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DATAQ INSTRUMENTS

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Designed and manufactured in the
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Warranty and Service Policy

Product Warranty

DATAQ Instruments, Inc. warrants that this hardware will be free from defects in materials and workmanship under normal use and service for a period of one year from the date of shipment. DATAQ Instruments' obligations under this warranty shall not arise until the defective material is shipped freight prepaid to DATAQ Instruments. The only responsibility of DATAQ Instruments under this warranty is to repair or replace, at its discretion and on a free of charge basis, the defective material.

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3. For in-warranty repairs, DATAQ Instruments will return repaired items to the buyer freight prepaid. Out of warranty repairs will be returned with freight prepaid and added to the service invoice.

Table of Contents

Specifications

Analog Inputs

Number of channels		32 differential
Input signal ranges		
Gain (software selectable)		Measurement range (DI-725, DI-725E)
	1	±10V, ±20V
	2	±5V, ±10V
	4	±2.5V, ±5V
	8	±1.25V, ±2.5V
Input Coupling		
Maximum working voltage (signal and common mode)		Each input should remain within ±10V of chassis ground
Overvoltage protection		For the DI-725, ±30V powered on and off; For the DI-725E, ±120V powered on and off
Inputs protected		Channels 1-32

Transfer Characteristics

Nonlinearity	±0.01% FSR
Offset error	±1mV ±5mV/gain
Gain error	0.05% FSR

Amplifier Characteristics

Input impedance	
Normal powered on	>1MΩ
Overload or powered off	1kΩ
CMRR	80dB
CMRR input range	±10V

Dynamic Characteristics

Settling time	8ms (0.01%)
Crosstalk	-72dB @ 100kHz & 100W unbalance

Stability

Recommended warm-up time	15 minutes
Offset temperature coefficient	(±2 ±50/gain)mV/°C

Physical

Dimensions	9 x 7.29 x 1.52 inches
I/O Connectors	37-pin male D, front; 40-pin ribbon cable, back

Environment

Operating temperature	0 to 50°C
Storage temperature	-20 to 70°C
Relative humidity	5% to 90% noncondensing

DI-725 General

The DI-725 is a 32-channel analog expansion device for DI-400, DI-720, and DI-730 instruments. The DI-725 features 32 differential analog inputs. The DI-725 is powered by the host DI-400, DI-720, or DI-730 instrument and in most cases will not need an additional power supply. However, when several DI-725s are linked together, an additional power source may be required (indicated by a glowing POWER LOW lamp). The DI-725E requires an additional power source connected via the power input jacks located on the rear panel of the instrument.

Input signal ranges are as follows:

Gain (Software Selectable)	Measurement Range (DI-725*)	Measurement Range (DI-725E**)
1	±10V	±20V
2	±5V	±10V
4	±2.5V	±5V
8	±1.25V	±2.5V

* For the DI-725, overvoltage protection is ±30V powered on and off.

** For the DI-725E, overvoltage protection is ±120V powered on and off.

In return for the 32 expansion channels it provides, each DI-725 consumes two channels from its host instrument. When a single DI-725 is connected to a DI-400, the combination provides 46 total channels (14 channels are still available on the host DI-400). When connected to a DI-720, the combination delivers 62 total channels (30 are still available on the host DI-720). When connected to a DI-730, the DI-725 adds 32 high level differential inputs to the host's 8 wide measurement range inputs for a diverse blend of 40 total channels. A maximum of 240 channels may be configured using multiple DI-725s.

Connecting the DI-725 to the Host Instrument

***NOTE**: The included expansion signal cable and dual-ended power cable are sized to fit when the DI-725 is stacked on top of (or below) the host DI-720 or DI-730 instrument. If you are using these instruments and they are not in a stacked configuration, do so before proceeding.*

1. Connect the appropriate end of the included expansion signal cable to the host instrument:

If you have this instrument:	Then connect the expansion cable to:
DI-400	The DI-400's 37-pin "D" connector
DI-720	EXPANSION on the rear panel of the DI-720
DI-730	EXPANSION on the rear panel of the DI-730

2. Connect the other end of the expansion cable to EXPANSION IN on the rear panel of the DI-725. Power for the DI-725 is obtained from the host instrument through this cable. Power for the DI-725E must be supplied via the power input jacks.

Features, Controls, and Indicators

DI-725 Front Panel

The two, 37-pin, male “D” connectors are used to connect your analog input signals to the DI-725. It can accept 32 high-level or preconditioned analog inputs in a differential configuration (one positive (+) and one negative (-) signal lead per channel). High-level inputs are typically low impedance, no-conditioning-required signals in the range of ±1.25 to ±10 volts full scale.

DI-725 Rear Panel

POWER switch — Controls power to the DI-725 instrument. 1 is on, 0 is off.

POWER input jacks — Allows you to apply an alternate power source to the instrument, if necessary. The DI-725 is powered by its host DI-400, DI-720, or DI-730 instrument and in most cases will not need an additional power supply. However, many factors can influence how much power is available to the DI-725 from its host instrument. When the DI-725 cannot derive adequate power from its host instrument, the POWER LOW indicator will glow red. This indicates that an alternate power source is necessary. Any suitable power source (+9 to +36 volts DC at 3A maximum) may be connected to either jack to provide the necessary power. When an alternate power source is connected, the remaining jack can be used as an additional power outlet.

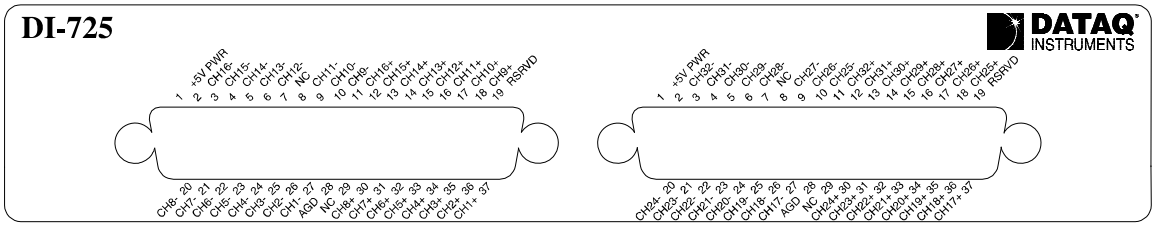
POWER status lamp — Glows green when the POWER switch is in the 1 position, indicating power is applied.

POWER LOW lamp — Glows red when the DI-725 cannot derive adequate power from its host instrument. In this case, an alternate power source is required.

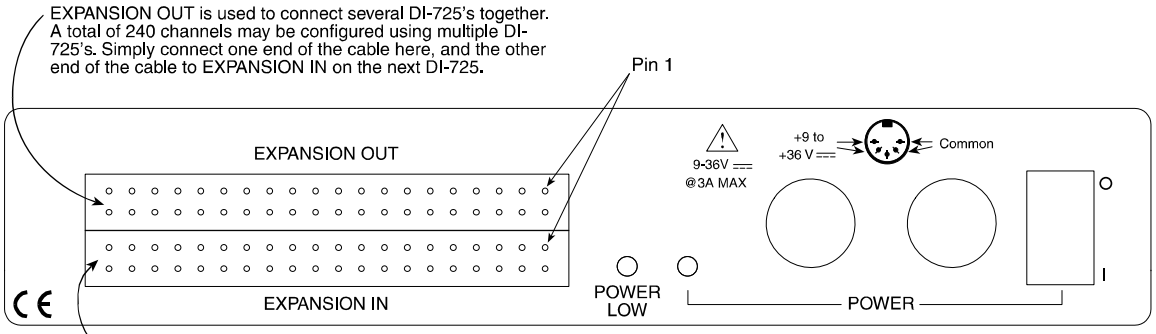
If the POWER LOW lamp comes on and you are using the DI-725 with a DI-720 or DI-730, the power supply that is powering these host instruments can be used to power the DI-725 as well. Simply unplug the five-pin DIN end of the power adapter cable that is currently supplying power to your DI-720 or DI-730, and plug it into one of the DI-725’s power input jacks. Now plug one end of the supplied dual-ended power cable into the remaining power jack on the DI-725 and plug the other end into the host instrument power input jack.

EXPANSION OUT connector — Used to connect multiple DI-725’s together. Connect one end of an expansion cable to this connector and connect the other end of the cable to EXPANSION IN on the next DI-725.

EXPANSION IN connector — Connects the DI-725 to its host DI-400, DI-720, or DI-730 instrument.



DI-725 Front Panel



DI-725 Rear Panel

EXPANSION IN and EXPANSION OUT connector pin-out

+5V	1	2	RESERVED
RESERVED	3	4	RESERVED
RESERVED	5	6	RESERVED
PWR GND	7	8	RESERVED
RESERVED	9	10	RESERVED
CH16	11	12	CH15
CH14	13	14	CH13
CH12	15	16	CH11
CH10	17	18	CH9
A GND	19	20	RESERVED
RESERVED	21	22	RESERVED
RESERVED	23	24	RESERVED
RESERVED	25	26	RESERVED
RESERVED	27	28	A GND
RESERVED	29	30	CH8
CH7	31	32	CH6
CH5	33	34	CH4
CH3	35	36	CH2
CH1	37	38	RESERVED
RESERVED	39	40	RESERVED

Configuring Channels with the DI-725

In WINDAQ/Pro or WINDAQ/Pro+ data acquisition software, channels are enabled or configured for acquisition with the channel selection grid. The channel selection grid is accessed by selecting Channels… from the Edit menu (in the SET-UP operating mode of WINDAQ software).

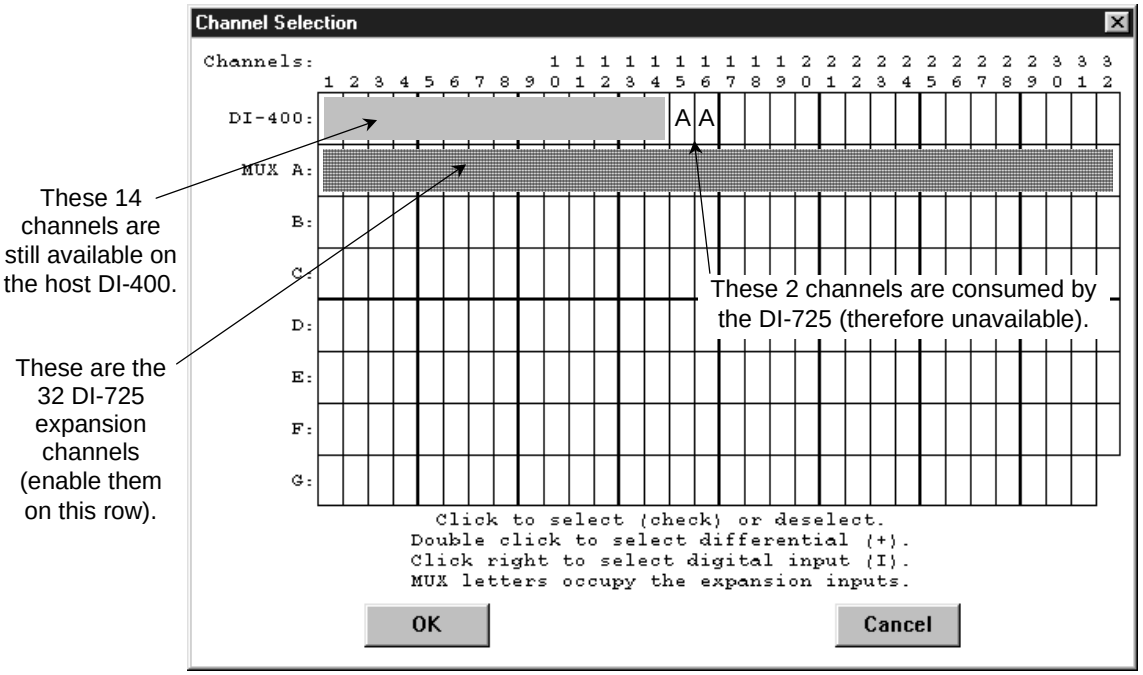
Each box in this grid potentially represents an input channel. An input channel is enabled by clicking the desired box. Which box you click, which mouse button you click with, and how many times you click the mouse button determines whether the input channel is enabled for single-ended operation, differential operation, or digital input operation.

The following pages show how to enable channels when using the DI-725 with a DI-400, DI-720, and DI-730 host instrument.

DI-400 Host Instruments

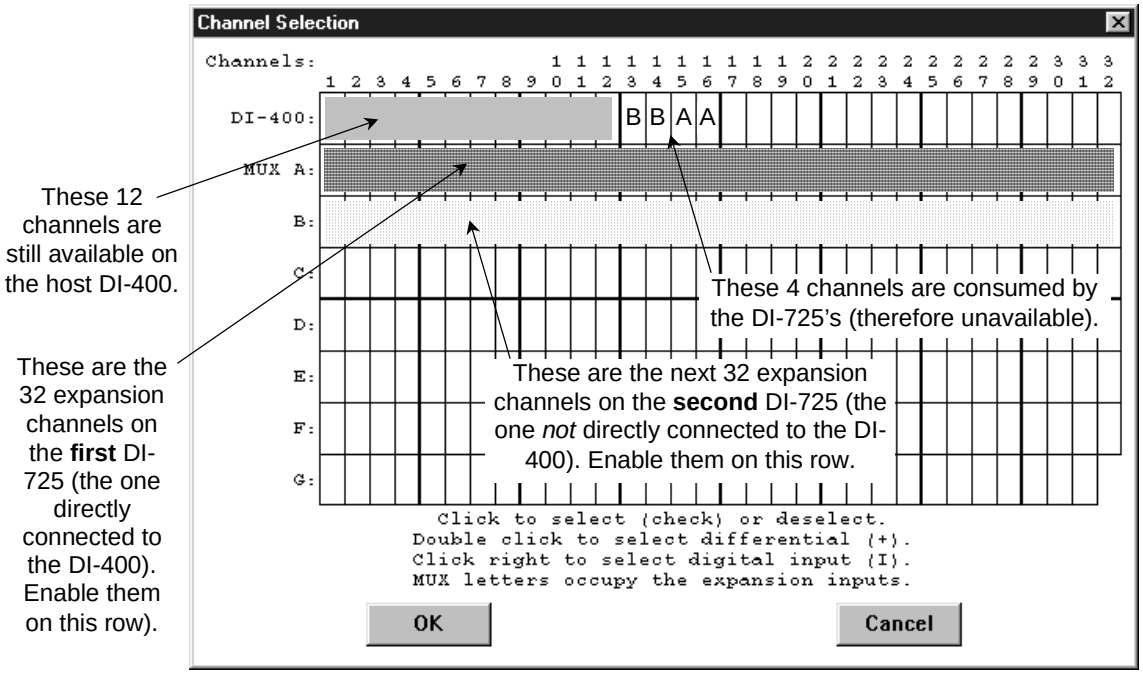
The following channel selection grid is typical when a single DI-725 is used with a DI-400. Note that the DI-400 channels are enabled on the top row of the grid and the DI-725 channels are enabled on the row labeled “MUX A”. The shaded area on the top row shows the channels that are still available on the host DI-400 instrument when the DI-725 is added.

When a Single DI-725 is Used.



The following grid is typical of two DI-725’s used with a DI-400. Note the pattern. Each DI-725 consumes the two highest-numbered channels on the host DI-400, and the expansion channels are enabled on the next MUX row down. The result is similar when more DI-725’s are added to the system.

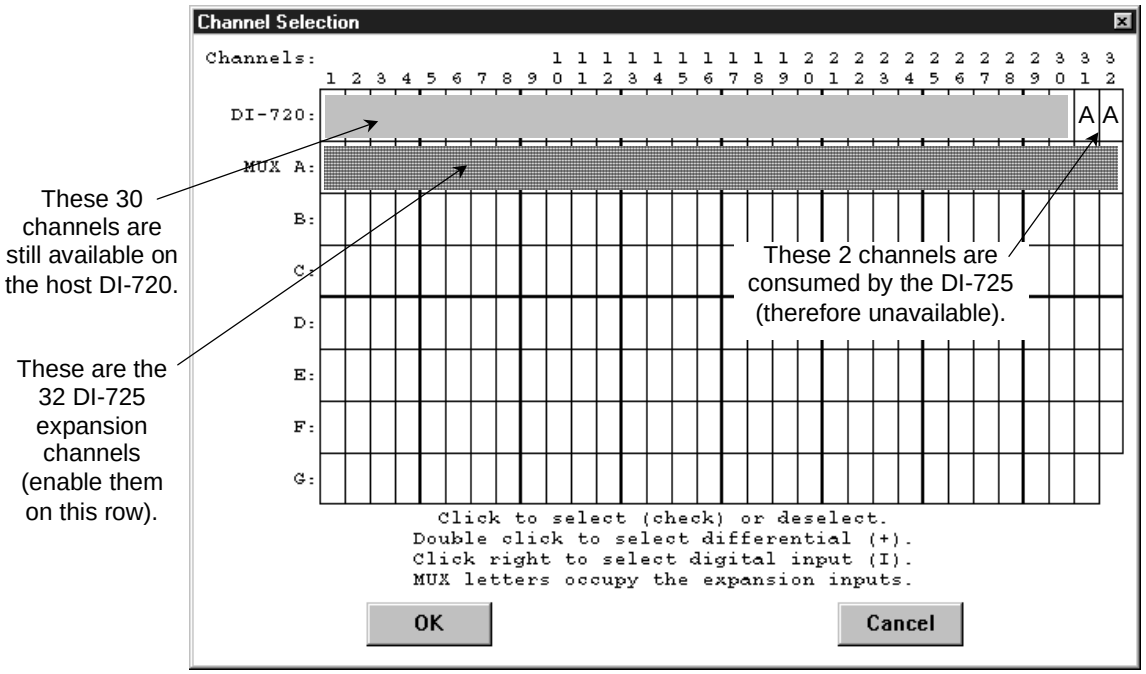
When Two DI-725’s are Used.



DI-720 Host Instruments

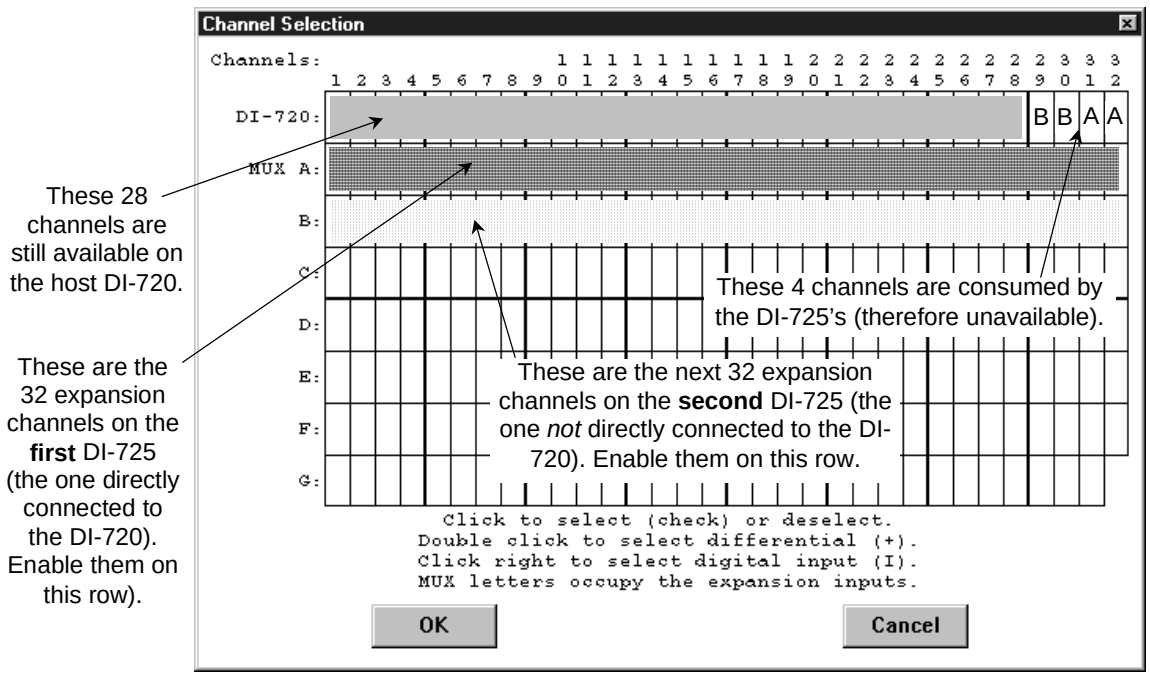
The following channel selection grid is typical when a single DI-725 is used with a DI-720. Note that the DI-720 channels are enabled on the top row of the grid and the DI-725 channels are enabled on the row labeled “MUX A”. The shaded area on the top row shows the channels that are still available on the host DI-720 instrument when the DI-725 is added.

When a Single DI-725 is Used.



The following grid is typical of two DI-725’s used with a DI-720. Note the pattern. Each DI-725 consumes the two highest-numbered channels on the host DI-720, and the expansion channels are enabled on the next MUX row down. The result is similar when more DI-725’s are added to the system.

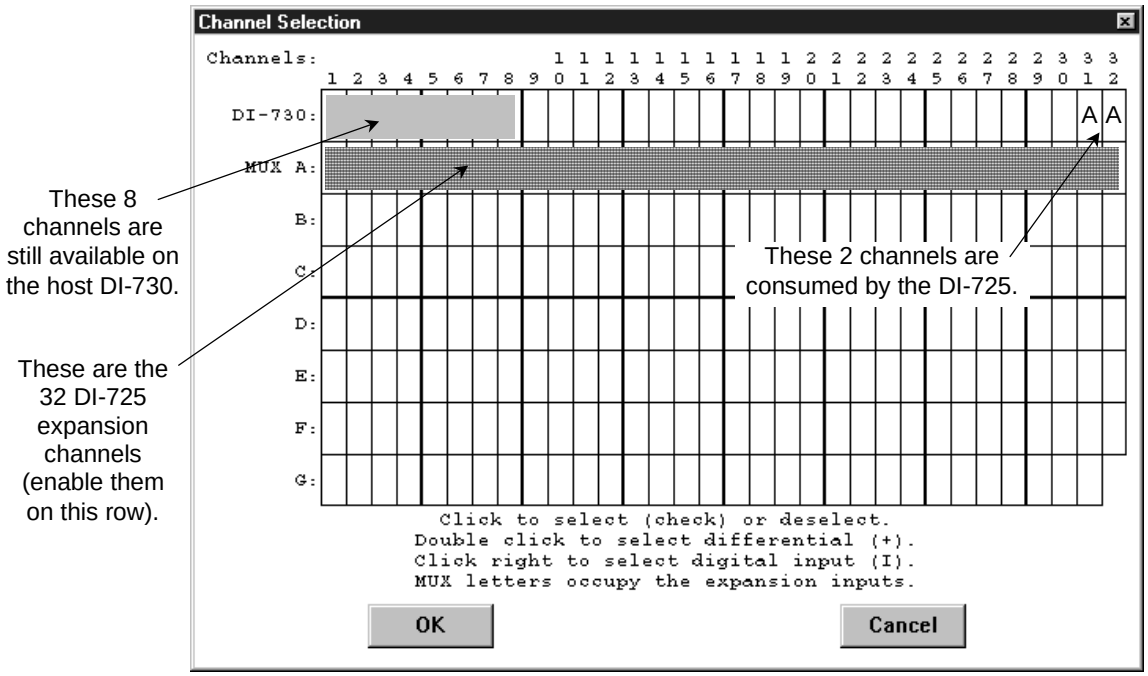
When Two DI-725’s are Used.



DI-730 Host Instruments

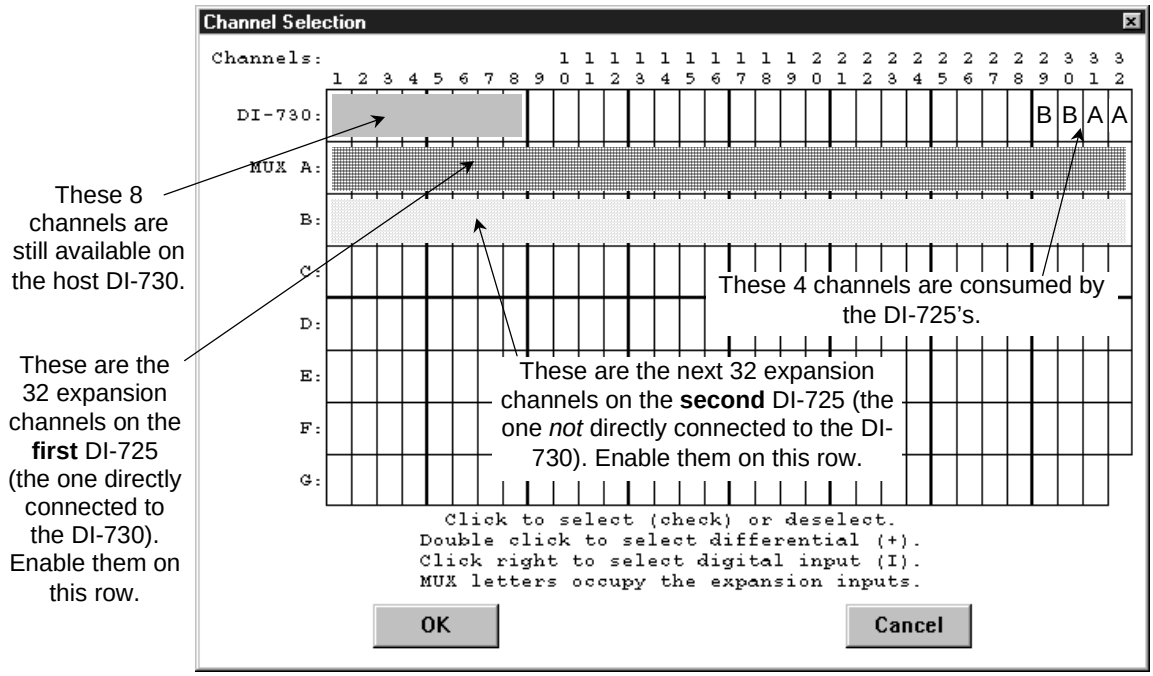
The following channel selection grid is typical when a single DI-725 is used with a DI-730. Note that the DI-730 channels are enabled on the top row of the grid and the DI-725 channels are enabled on the row labeled “MUX A”. The shaded area on the top row of the grid shows the channels that are still available on the host DI-730 instrument when the DI-725 is added.

When a Single DI-725 is Used.



The following grid is typical of two DI-725’ s used with a DI-730. Note the pattern. Each DI-725 consumes the two highest-numbered channels on the host DI-730, and the expansion channels are enabled on the next MUX row down. The result is similar when more DI-725’s are added to the system.

When Two DI-725’s are Used.



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