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File Reference Number - 8030

SQUARE D

Instruction Bulletin

Bulletin No. 30598-372-01A2
June, 1993
Raleigh, NC, U.S.A.

16 Function 24 VDC Input Base Unit
TBX DES1622

DESCRIPTION

The DES1622 16 Function 24 VDC Input Base Unit is one of several types of Distributed I/O (DIO) devices designed for applications in which a small number of I/O points at a location are required when using the PASSPORT™ I/O System.

In this instruction bulletin, the SY/MAX Class 8030 Type CRM250 Local IO/NET™ Interface Module (LIO), the SY/MAX Class 8030 Type CRM260 Remote Interface Module (RIO), SY/MAX Class 8030 Type CRM270 Distributed Remote IO/NET Interface Module (DRIO), and IO/NET link are collectively referred to as the PASSPORT I/O system.

The PASSPORT I/O System allows up to 32 drops to be distributed over a large area, providing a maximum of 4096 registers of external I/O in a single SY/MAX® programmable controller system.

Like full-size SY/MAX Class 8030 I/O rack assemblies, up to 32 DIO drops can be connected on an IO/NET cable over a maximum length of 7,500 feet. DIO drops can be intermixed on the IO/NET link with full-size SY/MAX I/O.

The DES1622 base unit provides 16 inputs for devices such as limit switches, proximity switches, and push buttons.

Input devices are wired to a removable terminal strip located on the DIO base unit. All DIO base units require the SY/MAX Class 8030 Type CRM270 Distributed Remote IO/NET (DRIO) Interface or the TBX CBS Expansion Interface for the I/O blocks. The Type CRM270 interface contains the power supply and IO/NET interface. For additional information on the CRM270 interface and the CBS interface, refer to Instruction Bulletins 30598-816 and 30598-371 respectively.

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SPECIFICATIONS

Base Unit Power

Operating voltage ..... 24 VDC nominal; 19-30 VDC
Maximum allowable ripple 10% of nominal supply voltage

Operating current at nominal voltage:

Configuration	Typical	Maximum
CRM270 without CBS010 Interface	145mA	180mA
CRM270 with CBS010 Interface and secondary base	160mA	200mA

Inputs

Inputs per base unit..... 16
Number of input commons..... 8
Isolation rating..... 1500 V between inputs and earth terminals
Voltage operating range..... 24 VDC nominal; 19-30 VDC
Nominal input current draw.... 16mA at 24 VDC
Must turn-on voltage ..... 11 VDC
Must turn-on current..... 6mA
Must turn-off voltage..... 5 VDC
Maximum turn-on time ..... 15 ms
Maximum turn-off time..... 17 ms
Control input voltage monitor trip threshold..... 18 VDC
Status indication ..... LED per point on CRM270
LED operation indication ..... Red LED illuminates when receiving an “ON” signal from the field input device. Red “RCK ERR” LED flashes when monitor senses low control input voltage.

Environmental and Physical

Operating temperature rating.. 0 to 60° C (32 to 140° F)
Storage temperature rating ..... -25 to 70° C (-13 to 158° F)
Humidity rating ..... 5 to 95% RH, non-condensing
Dimensions (H x W x D):
Base unit with terminal strip ..... 3.43 x 9.25 x 2.4 in
87 x 235 x 61 mm
Base with CRM270 or Base with CBS010..... 3.43 x 9.25 x 2.91 in
87 x 235 x 73.9 mm
Weight (Base unit only)..... 1.3 lbs/0.6 kg

Agency Approvals

Complies with UL508 and CSA C22-2 requirements; FM Class I, Division 2 Hazardous Locations approval pending.

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BASE UNIT WIRING

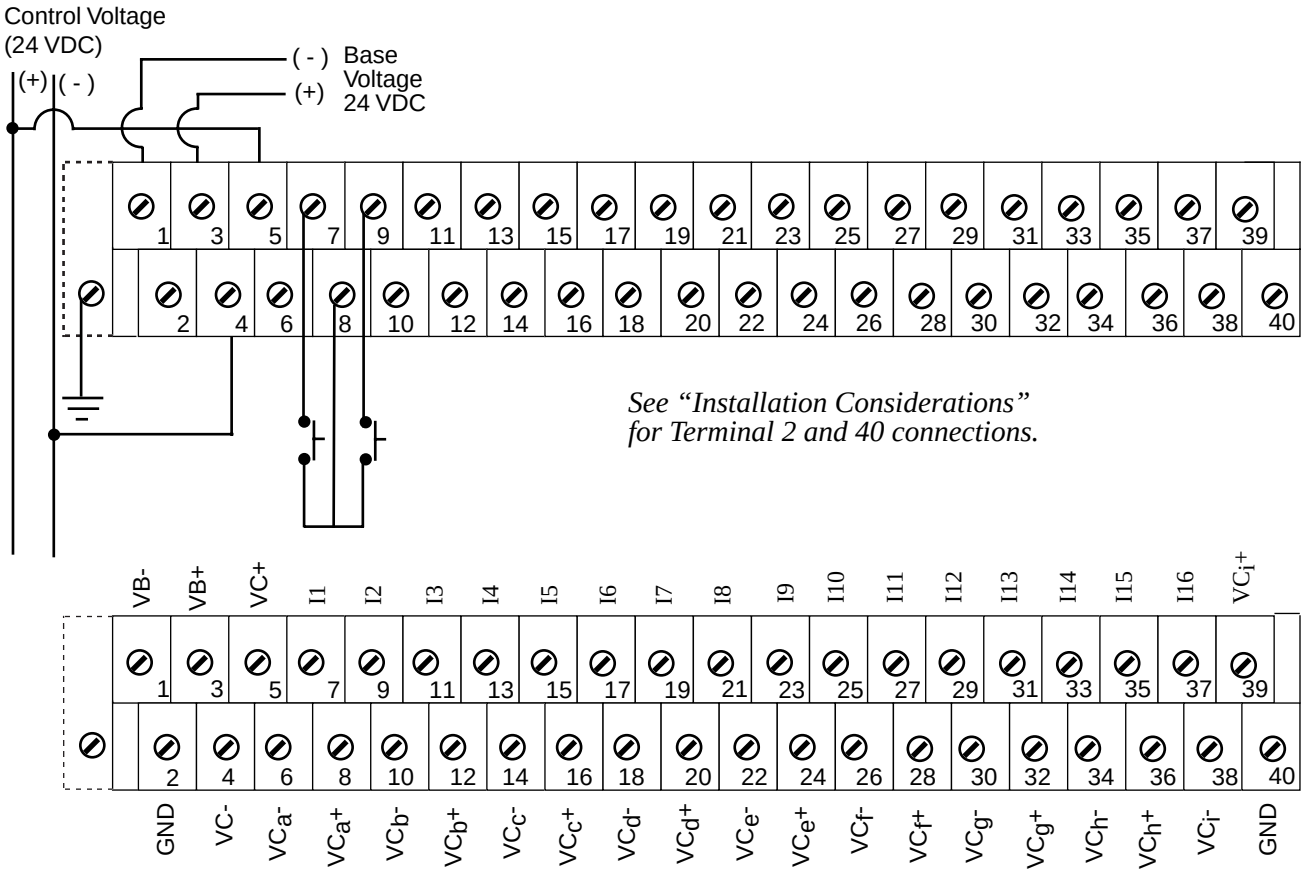
Input devices are wired to the terminal strip on the top of the base unit. Figure 1 shows the terminal strip pin-out for the base unit.

The DES1622 provides separate terminals for base voltage and control input voltage. These terminals may be connected to a common 24 VDC supply or may be sourced by independent supplies (VB- and VC- must be at the same potential).

The base units require the Class 8030 Type CRM270 IO/NET remote interface. One CRM270 interface and a CBS expansion interface can be used together to control two base units.

NOTE

- **Ground equipment using the screw provided. The base must be properly grounded before applying power.**
- **Do not use metallic conduit as a ground conductor.**



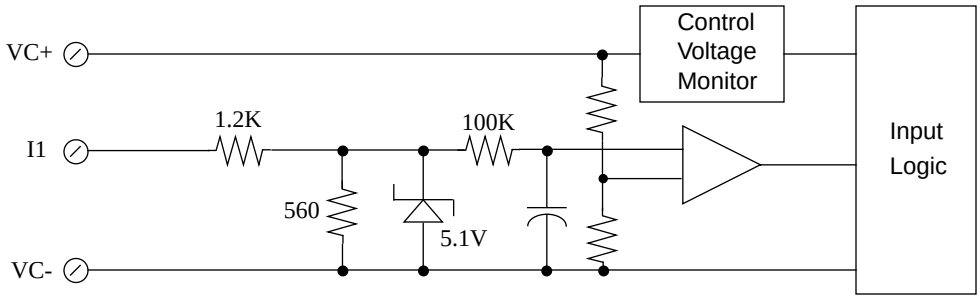
VB = Base Voltage

VC = Control Input Voltage

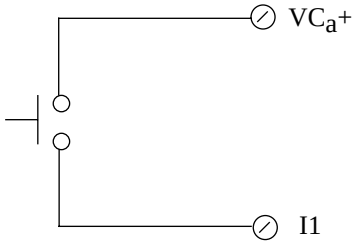
Figure 1 TBX DES1622 Wiring Connections and Terminal Block Signal Assignments

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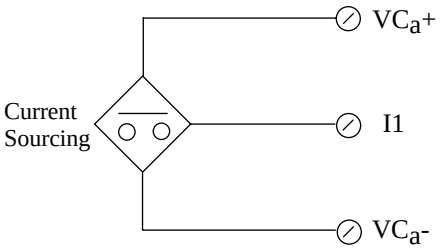
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Simplified Schematic for 24 VDC Input



Method of connecting a "Hard Contact" Input



Method of connecting a "Solid-State" Input

NOTE: The solid-state input device must have a current sourcing (or PNP) output.

Figure 2 - Simplified Schematics and Input Connections for DES1622 Base Unit

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INSTALLATION CONSIDERATIONS

- *Base Voltage* - The DES1622 base requires a 24 VDC operating voltage to be applied between VB+ and VB- (terminals 3 and 1).
- *Grounding* - The green ground wire must be connected to the ground screw beside the terminal block.
- *Jumper Wire* - A #16 AWG wire must be installed between terminals 2 and 40.
- *External Wiring* - Each terminal will accommodate up to two #16 AWG gauge wires. All external wiring shall be in accordance with applicable wiring codes and standards.
- *Commons* - The DES1622 base unit has one common terminal for every two inputs.
- *Control Input Voltage* - The control input voltage connected to VC+ (terminal 5) and VC- (terminal 4) is available at $VC_{a\text{-}i}+$ and $VC_{a\text{-}i}-$ for powering input devices. There is one set of control input voltage terminals for every two inputs. For example, VC_a+ and VC_a- provide control power for inputs 1 and 2 while VC_b+ and VC_b- powers inputs 3 and 4, and so on.

  There are two spare control input voltage terminals, VC_{i+} and VC_{i-} (terminals 39 and 38).
- *User Supplied Input Power*- The input devices may be powered from a different 24V control input voltage power supply than that used to power the base. This supply needs to be connected between VC+ and VC- (terminals 5 and 4). If separate supplies are used, they must share the same common. If the input devices are to be powered from the same supply that powers the base, then a jumper wire is required from VB+ to VC+ (terminal 3 to terminal 5). Base and control power lines should be externally fused by the user.

FUNCTIONAL CONSIDERATIONS

- *Control Voltage Sensing* - The DES1622 base unit monitors the control input voltage. The status of this voltage is indicated in bit 1 of register S0003. See “Register Usage for Rack Addressing ”for bit sense. A flashing “RCK ERR” LED indicates a control voltage problem.
- *Removable Terminal Block* - Before removing the terminal block assembly, be sure that all power is disconnected to the module. The assembly may be removed by pushing the holding tabs on each end directly out from the assembly. After reinstallation, ensure that the holding tabs are returned to their upright position.

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REGISTER USAGE FOR RACK ADDRESSING

The DES1622 base unit requires the assignment of three registers for all I/O and diagnostic registers.

At least one register must be assigned to the DES1622 base unit, or the DRIO will return a rack addressing error. If more than three registers are assigned to the DES1622, the remaining registers will act as internal storage registers in the LIO. Refer to Instruction Bulletin #30598-816, Type CRM270 (DRIO) interface, for additional information.

TBX DES1622 Base Unit Register Usage

Reg.	Name / Function	Reg. Type	Class	Point / Global	Point Definitions:	
					0	1
S0001	Input register	In	I/O	Point (01-16)	Input Off/Low	Input On/High
S0002	(reserved)	Out				
S0003	Control input voltage status register	In	Diagnostic	Global		

See the following chart for Register S0003 global definitions.

Global Definitions:		
S0003	**Control input volt. status register**	
	0	**1**
-01	Control Input Volt. OK	Control Input Volt. Fault
-02	(reserved)	(reserved)
-03	(reserved)	(reserved)
-04	(reserved)	(reserved)
-05	(reserved)	(reserved)
-06	(reserved)	(reserved)
-07	(reserved)	(reserved)
-08	(reserved)	(reserved)
-09	(reserved)	(reserved)
-10	(reserved)	(reserved)
-11	(reserved)	(reserved)
-12	(reserved)	(reserved)
-13	(reserved)	(reserved)
-14	(reserved)	(reserved)
-15	(reserved)	(reserved)
-16	(reserved)	(reserved)

⚠ WARNING

UNINTENTIONAL EQUIPMENT OPERATION

Do not use reserved registers and bits in ladder programs. Erratic operation may result.

Failure to observe this precaution can result in equipment damage, personal injury, or death!

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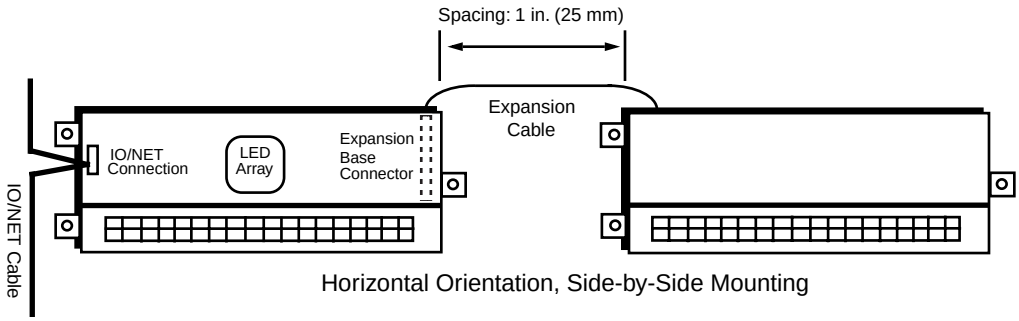
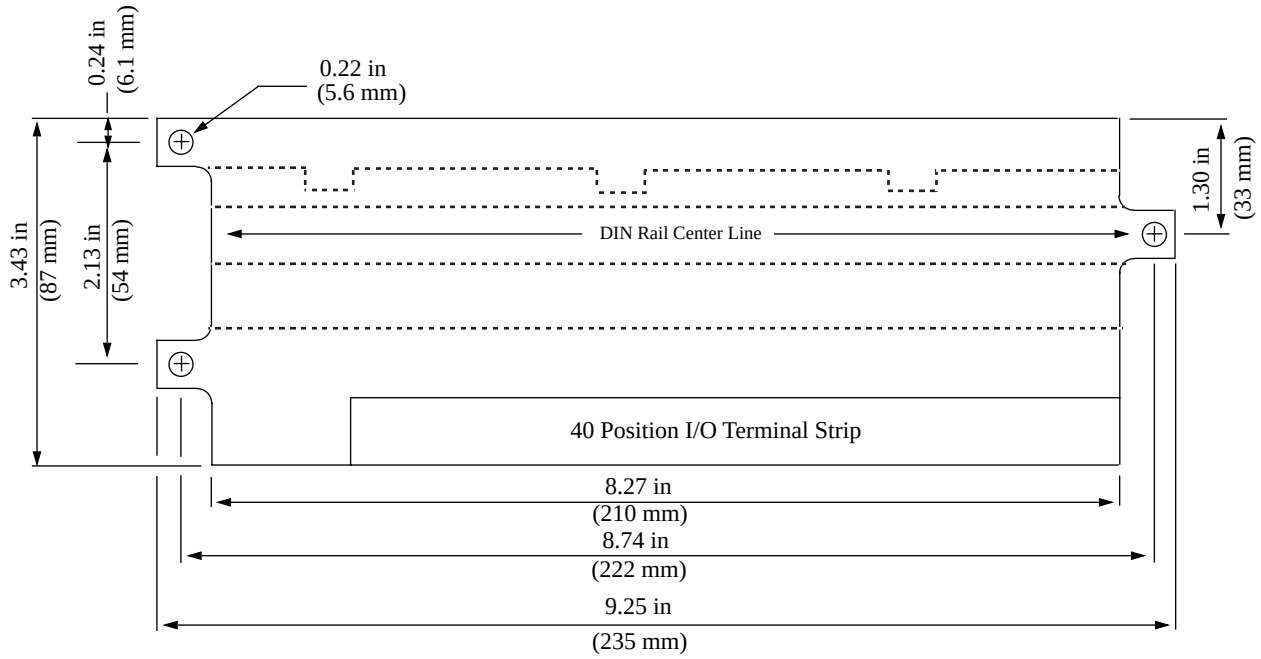


Figure 3 Installing the Base Unit

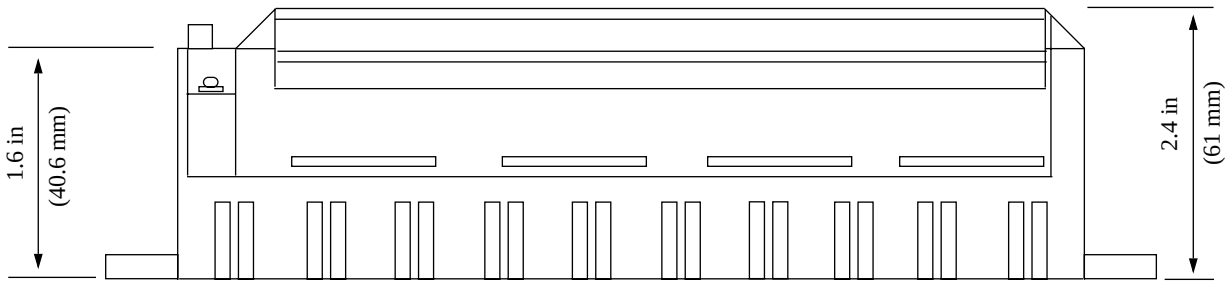
MOUNTING INSTRUCTIONS

The base unit can be mounted in the orientation shown in Figure 3. The dimensions of the base unit are as illustrated in Figure 4.

Spring clips are also provided on the bottom of the base unit for DIN rail mounting.



Top view with DIN rail mounting dimensions



Side view

Figure 4 Dimensions

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