



Installation and Operation Manual

for the

USN-1616L Universal Serial I/O Controller

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All specifications and features for this product are subject to change without notice.


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Broadcast Tools, Inc.
USN-1616L

INTRODUCTION

Thank you for your purchase of a Broadcast Tools, Inc., USN-1616L Universal Serial I/O Controller. We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the unit.

 **NOTE:** This manual should be read thoroughly before installation and operation.

WHO TO CONTACT FOR HELP

The enclosed product is supported by the software manufacturer. If you are in need of help installing or operating this product, please contact the software company.

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Thank you for choosing Broadcast Tools!

Broadcast Tools, Inc.

USN-1616L

The USN-1616L is designed for general I/O control applications. The USN-1616L is equipped with 16 form C relays with LED indicators. The USN-1616L provides 16 - 5 to 24 volt opto-isolated inputs with LED status and may be configured for wet or dry applications. The USN-1616L is interfaced to your computer by either an on-board RS-232 or RS-485 serial port at 9600 baud, allowing up to 32 - USN-1616L's to be controlled over a single twisted pair cable 4000 feet from the host computer in the RS-485 mode. The USN-1616L is designed to be polled, however a 5 ms sync pulse is provided to simulate an interrupt on the DSR input of the host computer.

Input and output connections are via clamp style wire captive terminal strips. The USN-1616L is equipped with a switching type regulator, providing a wide range of power supply voltages.

The USN-1616L is supplied with a 9 vac, 500 ma type 120 vac 60hz wall transformer.

Two USN-1616Ls may be rack mounted with the optional RM-2 aluminum rack mount requiring 5.25" of rack space. (3 RU's).

Refer to the layout sheets provided at the end of this manual, for configuration Information.

Broadcast Tools, Inc.
USN-1616L

Input and output pin-outs

- | | |
|-----------------|--------------------|
| 1 - Input 1 + | 33 - Relay 1 N.O. |
| 2 - Input 1 - | 34 - Relay 1 Com |
| 3 - Input 2 + | 35 - Relay 1 N.C. |
| 4 - Input 2 - | 36 - Relay 2 N.O. |
| 5 - Input 3 + | 37 - Relay 2 Com |
| 6 - Input 3 - | 38 - Relay 2 N.C. |
| 7 - Input 4 + | 39 - Relay 3 N.O. |
| 8 - Input 4 - | 40 - Relay 3 Com |
| 9 - Input 5 - | 41 - Relay 3 N.C. |
| 10 - Input 5 + | 42 - Relay 4 N.O. |
| 11 - Input 6 - | 43 - Relay 4 Com |
| 12 - Input 6 + | 44 - Relay 4 N.C. |
| 13 - Input 7 - | 45 - Relay 5 N.O. |
| 14 - Input 7 + | 46 - Relay 5 Com |
| 15 - Input 8 - | 47 - Relay 5 N.C. |
| 16 - Input 8 + | 48 - Relay 6 N.O. |
| | 49 - Relay 6 Com |
| | 50 - Relay 6 N.C. |
| | 51 - Relay 7 N.O. |
| 17 - Input 9 + | 52 - Relay 7 Com |
| 18 - Input 9 - | 53 - Relay 7 N.C. |
| 19 - Input 10 + | 54 - Relay 8 N.O. |
| 20 - Input 10 - | 55 - Relay 8 Com |
| 21 - Input 11 + | 56 - Relay 8 N.C. |
| 22 - Input 11 - | 57 - Relay 9 N.O. |
| 23 - Input 12 + | 58 - Relay 9 Com |
| 24 - Input 12 - | 59 - Relay 9 N.C. |
| 25 - Input 13 - | 60 - Relay 10 N.O. |
| 26 - Input 13 + | 61 - Relay 10 Com |
| 27 - Input 14 - | 62 - Relay 10 N.C. |
| 28 - Input 14 + | 63 - Relay 11 N.O. |
| 29 - Input 15 - | 64 - Relay 11 Com |
| 30 - Input 15 + | 65 - Relay 11 N.C. |
| 31 - Input 16 - | 66 - Relay 12 N.O. |
| 32 - Input 16 + | 67 - Relay 12 Com |
| | 68 - Relay 12 N.C. |
| | 69 - Relay 13 N.O. |
| | 70 - Relay 13 Com |
| | 71 - Relay 13 N.C. |
| | 72 - Relay 14 N.O. |
| | 73 - Relay 14 Com |
| | 74 - Relay 14 N.C. |
| | 75 - Relay 15 N.O. |
| | 76 - Relay 15 Com |
| | 77 - Relay 15 N.C. |
| | 78 - Relay 16 N.O. |
| | 79 - Relay 16 Com |
| | 80 - Relay 16 N.C. |

DB-9 Connection:

- 2 - Send data to Computer.
- 3 - Rec data from Computer.
- 5 - Ground.
- 6 - DSR (5-6 ms Sync)

J-22 Output (Relay) control:

- Open = Normal data
- Closed = Inverted data

J-23 Input (Opto) Control:

- Open = Normal
- Closed = Inverted data

**Broadcast Tools, Inc.
USN-1616L**

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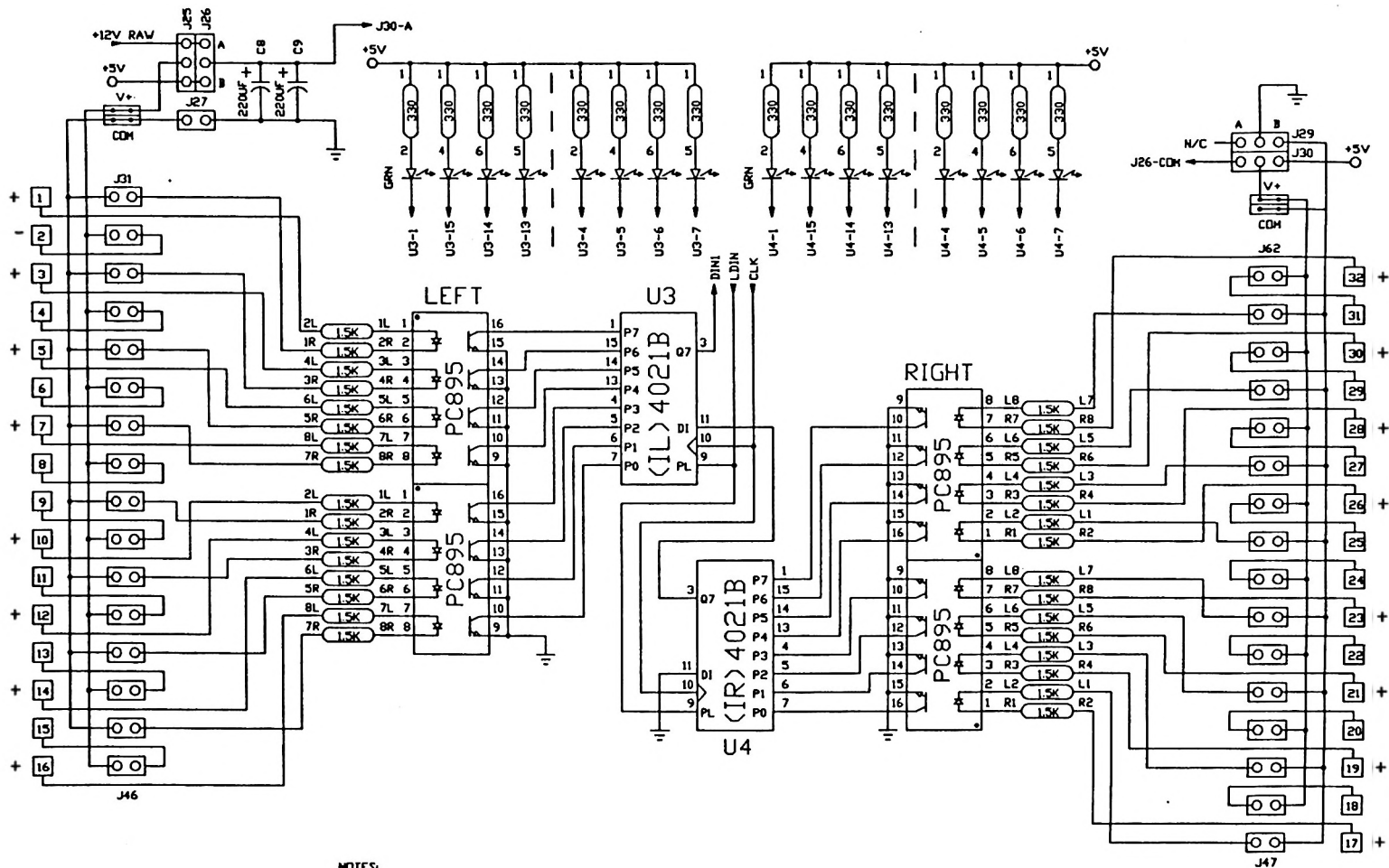
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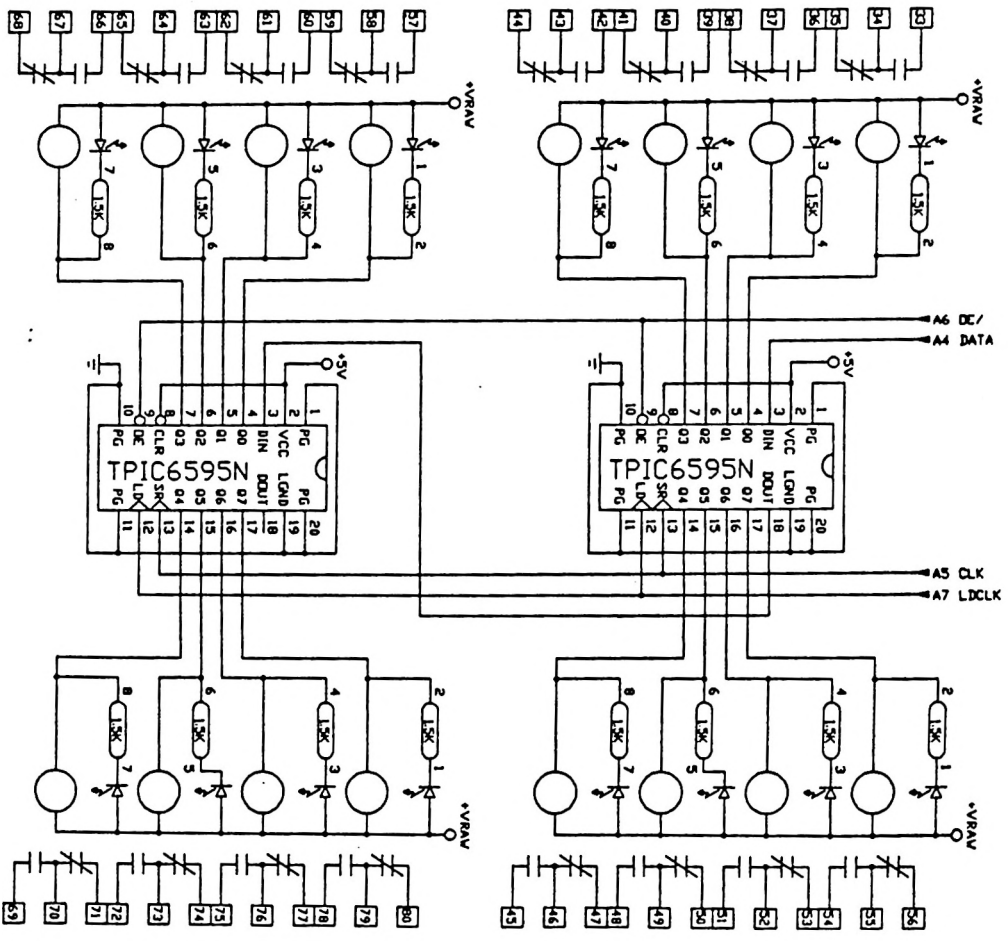
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NOTES:

- 1) MIN ISOLATED INPUT CURRENT = 1.2MA
- 2) MIN CURRENT TRANSFER RATIO = 20%
- 3) MAX. POWER (2 RESISTORS) = 0.25W
- 4) R = 6800 X 2, 18-60V, 12-4.5MA
- 5) R = 5100 X 2, 13-51V, 12-5.0MA
- 6) R = 4700 X 2, 12-48V, 12-5.1MA
- 7) R = 3300 X 2, 9-40V, 12-6.1MA
- 8) R = 2200 X 2, 7-32V, 12-7.3MA (STD)
- 9) R = 1500 X 2, 5-27V, 12-9.0MA
- 10) R = 1000 X 2, 3.8-22V, 12-11.0MA



DIGITAL & COM. JUMPER SELECTION

ACTUAL SIZE (1:1)

J24 A RS-485 COMMUNICATIONS
 B RS-232 COMMUNICATIONS

J25 A 'RAW' 12VDC TO T.S.
 B +5VDC TO T.S.

J26 A 'RAW' 12VDC TO RELAYS
 B +5VDC TO RELAYS

J27 DIGITAL COMMON TO T.S.
 T.S. COMMON ISOLATED

INDICATES JUMPER IS INSTALLED.

CLOSURE MODE: THIS MODE OF 'DRY' DIGITAL INPUT ALLOWS FOR EASY INTERFACET TO SWITCH AND/OR RELAY INPUT CLOSURES. WITH J25 AND J27 REMOVED, ISOLATED POWER CAN BE APPLIED TO THE TWO PIN TERMINAL STRIP NEAR J27. ISOLATED POWER CAN RANGE FROM 5VDC TO 24VDC WITH LOAD CURRENT OF 12mA TO 8mA PER CONTACT CLOSURE. WITH J25B AND J27 INSTALLED LOCAL NON-ISOLATED '+5V' POWER CAN BE USED TO POWER THE INPUTS.

ISOLATED MODE: THIS MODE OF 'WETTED' DIGITAL INPUT ALLOWS INDIVIDUALLY ISOLATED INPUTS. OBSERVE POLARITY AND LIMIT INPUT VOLTAGE FROM 5-24VDC.

WARNING! A VERTICAL JUMPER IN THIS LOCATION WILL CAUSE A POWER SUPPLY SHORT. ONLY USE VALID SETTINGS SHOWN ABOVE.

J1 RS485, RJ11, PIN-1 TO DIGITAL COMMON.

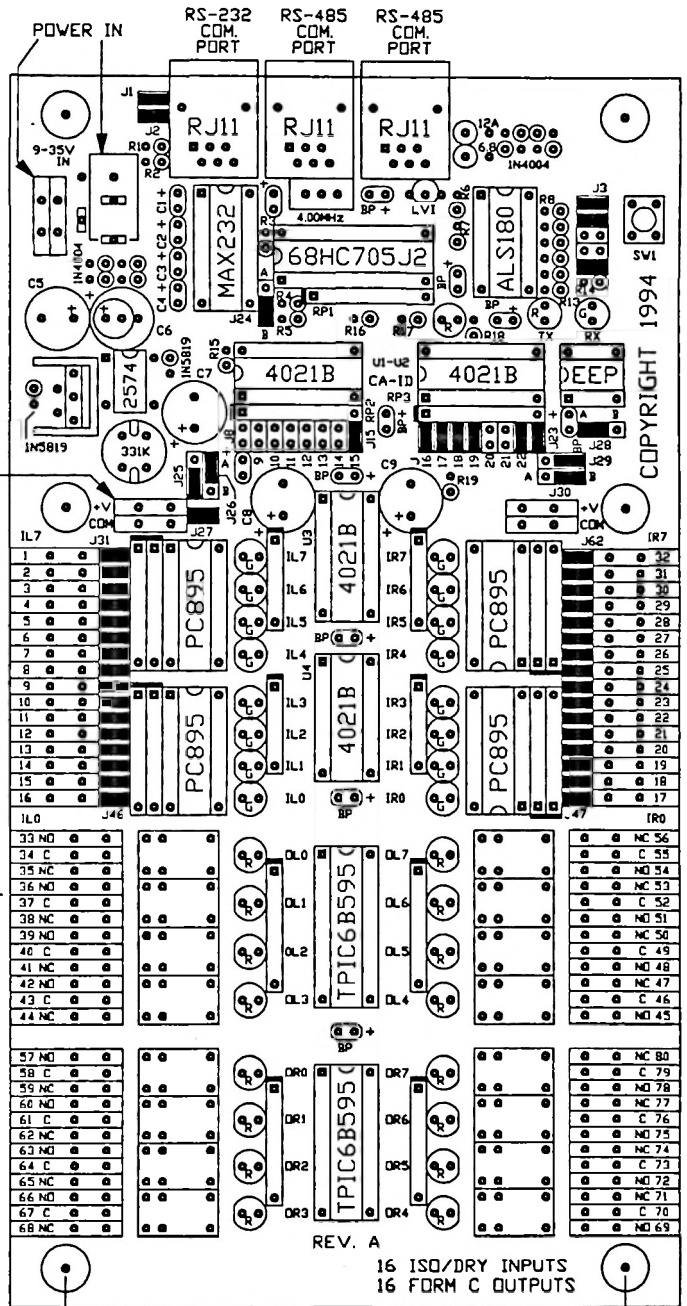
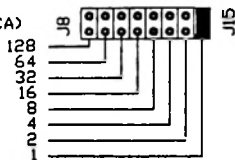
J2 RS485, RJ11, PIN-6 TO DIGITAL COMMON.

J3 INSTALL J3 & J4 FOR NORMAL RS-485 COMMUNICATIONS. MOVE JUMPERS J3 & J4 TO J5 & J6 FOR REVERSED MODE.

J7 INSTALL FOR RS485, 120 OHM TERMINATION.

COMMUNICATIONS ADDRESS (CA)

ADDRESS RANGE FROM
 0 TO 255 (000H-OFFH)
 (SHOWN FOR 001H)

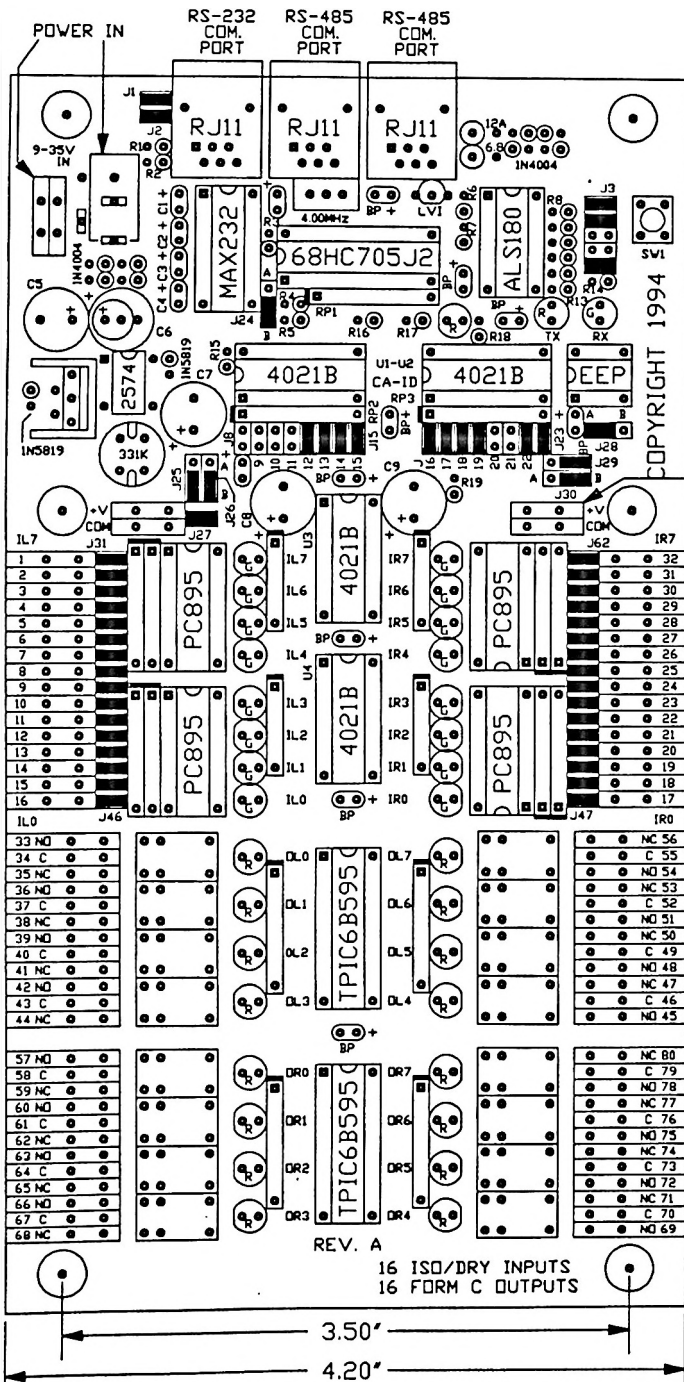


SHOWN WITH FACTORY SETTING FOR ALL JUMPERS.

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DIGITAL & COM. JUMPER SELECTION

ACTUAL SIZE (1:1)



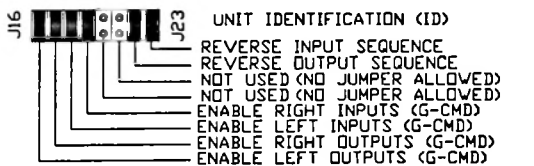
- J28 EE PROM WRITE PROTECT
- A B
- J28 EE PROM NOT PROTECTED
- J29 T.S. COMMON ISOLATED
- A B
- J29 DIGITAL COMMON TO T.S.
- J30 'RAW' 9-35VDC TO T.S.
- A B
- (IF J26A IS INSTALLED)
- J30 +5VDC TO T.S.

INDICATES JUMPER IS INSTALLED.

CLOSURE MODE: THIS MODE OF 'DRY' DIGITAL INPUT ALLOWS FOR EASY INTERFAC TO SWITCH AND/OR RELAY INPUT CLOSURES. WITH J29 AND J30 REMOVED, ISOLATED POWER CAN BE APPLIED TO THE TWO PIN TERMINAL STRIP NEAR J30. ISOLATED POWER CAN RANGE FROM 5VDC TO 24VDC WITH LOAD CURRENT OF 1.2mA TO 8mA PER CONTACT CLOSURE. WITH J29B AND J30B INSTALLED LOCAL NON-ISOLATED '+5V' POWER CAN BE USED TO POWER THE INPUTS.

ISOLATED MODE: THIS MODE OF 'WETTED' DIGITAL INPUT ALLOWS INDIVIDUALLY ISOLATED INPUTS. OBSERVE POLARITY AND LIMIT INPUT VOLTAGE FROM 5-24VDC.

WARNING! A VERTICAL JUMPER IN THIS LOCATION WILL CAUSE A POWER SUPPLY SHORT. ONLY USE VALID SETTINGS SHOWN ABOVE.



SHOWN WITH FACTORY SETTING FOR ALL JUMPERS.