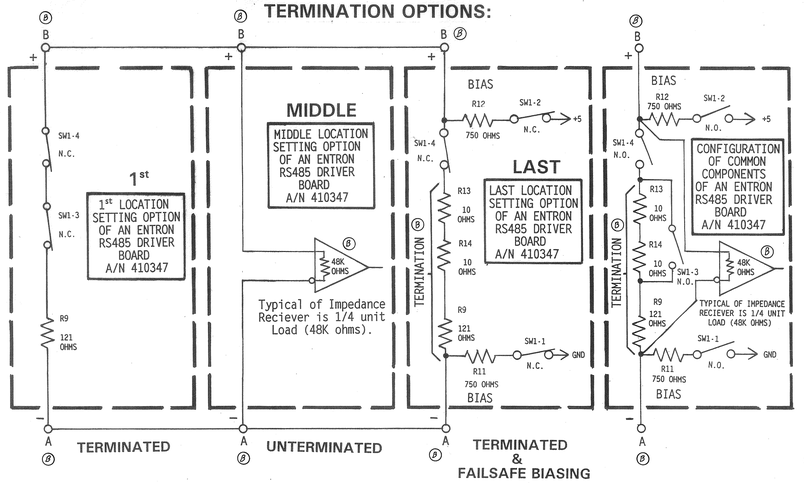
TERMINATION OPTIONS:



NOTES:

1. RT4 CONTROL:
   The Remote Terminal 4 (RT4) Control can be used with ENTRON Welding Controls that have a RS485 Driver Board Option and other NON-ENTRON devices that have a RS485 Interface Board. For Welding Controls, refer to either EN1000-Series/485, EN1001-Series/485, EN(X)1000-Series/485, EN(X)1001-Series/485, EN1000-Series/485 Cascade/Multi-Valve, or EN1001-Series/485 Cascade/Multi-Valve Control Wiring Diagram.

Ⓑ 2. DIP SWITCH "ON/OFF" SETTINGS:
   On ENTRON RS485 Driver Boards, DIP Switch Positions 1 thru 4 MUST be set to a specific "ON" or "OFF" setting. ENTRON RS485 Driver Boards, DIP Switch positions 1 thru 4 settings are determined by the location of each ENTRON RS485 Driver Board in a complete group of interconnected ENTRON RS485 Driver Boards. See ENTRON RS485 Driver Board DIP Switch Settings Chart for DIP Switch settings to each ENTRON RS485 Driver Board by location in the complete interconnect arrangement. For RT4 control, DIP Switch Positions 1 thru 4 are set as a first location RS485 Driver Board at the factory.
   NOTE: The RT4, S485 Converter, or US485 Converter control is typically recommended to be a first location RS485 Driver Board in an interconnect arrangement. However, this does not have to be a standard procedure.

   When an interconnect arrangement uses ONLY one (1) ENTRON RS485 Driver Board with other NON-ENTRON devices that have a RS485 Interface Board, set the ENTRON RS485 DIP Switch settings as a last location. This interconnect arrangement is NOT shown on this drawing.

   When an interconnect arrangement uses ONLY two (2) ENTRON RS485 Driver Boards with other NON-ENTRON devices that have a RS485 Interface Board, set one (1) ENTRON RS485 DIP Switch settings as a last location and set the other ENTRON RS485 DIP Switch settings as a middle location. Connect the NON-ENTRON device as a first location, this interconnect arrangement is NOT shown on this drawing.

   When three (3) or more ENTRON RS485 Driver Boards are used in an interconnect arrangement. Set ONLY one (1) RS485 DIP Switch as a first location, set ONLY one (1) other RS485 DIP Switch as a last location, and all other ENTRON RS485 DIP Switch's should be set as a middle location.
   NOTE: A quantity of ONLY one (1) each of the ENTRON RS485 Driver Boards are to be set as a first and last location in the complete interconnect wiring arrangement. However, more than one (1) middle located ENTRON RS485 Driver Boards may exist in the completed wiring arrangement. This interconnect arrangement is shown on this drawing.

   MULTIPLE CONTROLS IN ONE CABINET:
   When either an EN1000 or EN1001 multiple controls in one cabinet control is used, ENTRON RS485 Driver Board DIP Switch Settings are set according to how each of the RS485 Driver Boards are interconnected between any other external RS485 Driver Board(s). The J485A connector on PCB A/N 410347 can be used to interconnect the RS485 Driver Boards that have been installed in one cabinet.

Ⓑ 3. ALTERNATE INTERCONNECT WIRING ARRANGEMENT (NON-ENTRON RS485 DEVICES):
   An alternate interconnect wiring arrangement can be used in place of the interconnect wiring arrangement from what is shown on this drawing. The quantity of ENTRON Controls & NON-ENTRON devices that have a RS485 Interface Board may vary from what is shown on this drawing for a customers alternate interconnect wiring arrangement. A NON-ENTRON RS485 Interface Board may be interconnected to an ENBUS set as a first or middle located RS485. Do NOT set the NON-ENTRON RS485 Interface Board as a last located RS485. A first located RS485 should always be assigned to an ENTRON RT4 Control, U485 Converter, or S485 Converter. A NON-ENTRON RS485 Interface Board may be assigned ONLY as middle or first located RS485. The last location will be an ENTRON device set to last location at all times. The last location position provides BIAS.

   MAXIMUM CAPACITY OF ALTERNATE INTERCONNECT WIRING ARRANGEMENT FOR RT4 CONTROLS, ENTRON WELDING CONTROLS THAT HAVE A RS485 DRIVER BOARD OPTION, & OTHER NON-ENTRON DEVICES with RS485 INTERFACE BOARD(S).

   Up to a maximum combination of 128 ENTRON RS485 Driver Boards and NON-ENTRON RS485 Interface Boards can be interconnected.
   Up to a maximum of 64 ENTRON Welding Controls RS485 Driver Boards can be interconnected.
   Up to a maximum of 32 ENTRON RT4 Controls can be interconnected.
   Up to a maximum of 32 other devices (NON-ENTRON devices) with RS485 Interface Boards can be interconnected. NON-ENTRON devices may consist of personal computers or PLC's.
   The above assumes all devices are 1/4 Unit Load.

4. ENTRON WELDING CONTROL MINIMUM REQUIREMENTS:
   EN1000 CONTROLS:
   Sequence Control & Display Board Switch A/N 600541 MUST be at revision letter "RR" or any revision letter there after to function with a RS485 Driver Board.
   EN1001 CONTROLS:
   Sequence Control & Display Board Switch A/N 600572-002 MUST be at revision letter "T" or any revision letter there after to function with a RS485 Driver Board.
   EN1000 CASCADE/MULTI-VALVE CONTROLS:
   Program Board PCB A/N 410321 MUST be at revision letter "N" or any revision letter there after to function with a RS485 Driver Board.

Ⓑ 5. J485-J485 CABLE ASSEMBLY:
   J485-J485 Cable Assembly's are provided with the Welding Controls that have the RS485 Driver Board Option(s). The Cable Assembly's are to be assembled by the customer. 25 Feet (25') of Cable wire is provided. Additional length of Cable Wire and/or quantity of J485 Connectors are available. Maximum length of Cable Assembly NOT to exceed 2000 feet (2000'). See Application Note #700173.

Ⓑ 6. LOADING, TERMINATION, BIAS, & WIRE:
   LOADING:
   ENBUS is designed to operate with a maximum of 128 devices. Each Load on the BUS MUST be 1/4 unit load (48K Ohms). If ¼ unit load (24K Ohms) or 1 unit load (12K Ohms) are used, the maximum number of devices which can be used will be less. ENTRON RS485 Driver Board (A/N 410347) ENBUS devices are 1/4 unit load.

   TERMINATION:
   Both ends of ENBUS MUST be terminated. Use ENTRON RS485 Driver Board at last location position.

   BIAS:
   ONLY one (1) device should provide BIAS. Use ENTRON RS485 Driver Board at the last location position. Use ENTRON provided Cable Assembly(s) for interconnections. For this board to provide BIAS the Weld Control MUST be powered on when ENBUS is operated for correct operation.

   WIRE:
   CAT5 Cable wire can be substituted for ENTRON Cable wire P/N 900258.

   NOTE: The RS485 Driver Board Option (A/N 410347) that provides BIAS should be powered on when ENBUS is used.

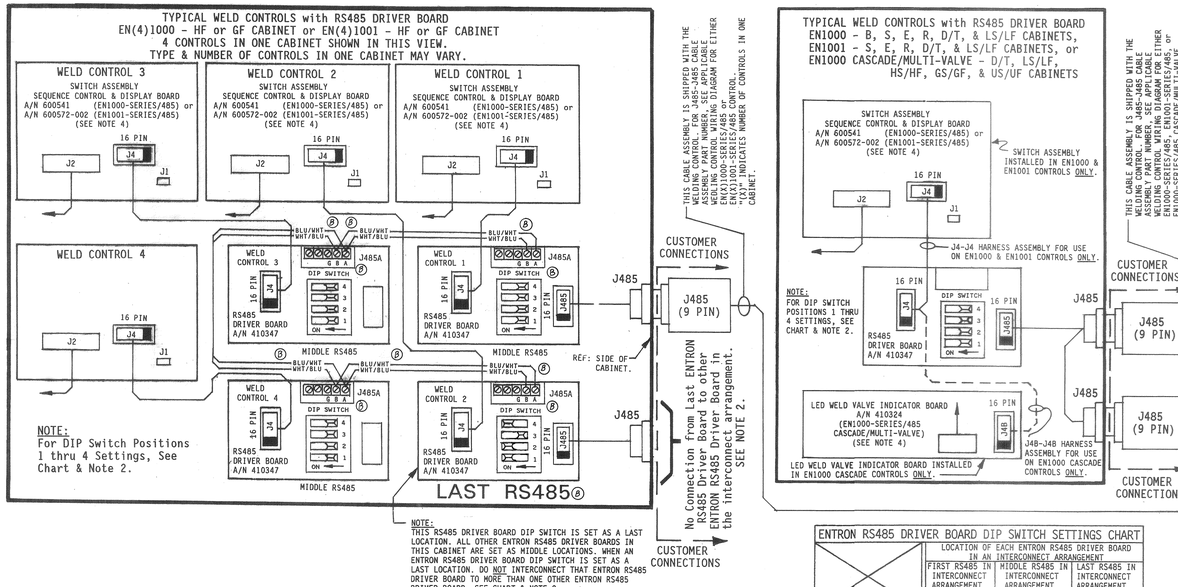
Ⓒ 7. RT4 IS OBSOLETE (7/13/11). SEE RT4jr. - ASSEMBLY 600715 AND WIRING DIAGRAM 421472.

QTY.	DESIG.	PART NO.	DESCRIPTION
X		600655	Assembly, Cabinet, Remote Terminal 4 (RT4), EN1000/EN1001 & EN1000/EN1001 Cascade, Consisting of:
X	PCB1	600541-007	Assembly, Sequence Control & Display Board, Remote Terminal 4 (RT4)
X	PCB5	410347	Assembly, PCB, RS485 Driver Board
X	PCB2	410324	Assembly, PCB, LED Weld Valve Indicator Board
Ⓑ X	U485	600691	Assembly, Isolated USB to RS485 Converter, (For NON-ENTRON RS485 Device), Consisting of:
		380005	Converter, Isolated USB to NON-ENTRON RS485 Device
		326049	Assembly, Cable, USB-"A" Male to USB-"B" Male
Ⓑ X	S485	600692	Assembly, Isolated RS232 to RS485 Converter, (For NON-ENTRON RS485 Device), Consisting of:
Ⓑ		380006	Converter, Isolated RS232 to NON-ENTRON RS485 Device
Ⓑ		380007	Power Supply, Plug-In, 120 VAC to 12 VDC
Ⓑ		326050	Assembly, Cable, 25 Pin to 25 Pin, S485 to NON-ENTRON RS485 Device
Ⓑ		326051	Assembly, Cable, 9 Pin to 25 Pin, S485 to NON-ENTRON RS485 Devices
Ⓑ			
Ⓑ			
Ⓑ			
Ⓑ			
Ⓑ X		700173	Application Note, Customer Assembly Instructions, J485-J485 & J485-J485-J485 Cable Assembly
X		700171	Application Note, RS485 Driver Board
1		421407	Wiring Diagram, Interconnection Wiring, RS485 Driver Boards, RT4 Control, & NON-ENTRON Devices

See Drawing #440463 for Customer Mounting Detail of RT4 Control.
X Parts shown in Parts List for reference only.
See Wiring Diagram #421406 for Remote Terminal (RT4) Control.
See Wiring Diagram #421448, for Isolated USB to RS485 Converter Assembly (U485) Option.
See Wiring Diagram #421449, for Isolated RS232 to RS485 Converter (S485) Option.
Application Note #700171 shipped with Welding Control and/or RT4 Control. See either RT4 Wiring Diagram #421406 or applicable Welding Control Wiring Diagram.
Application Note #700173 shipped with Welding Control. See applicable Welding Control Wiring Diagram.

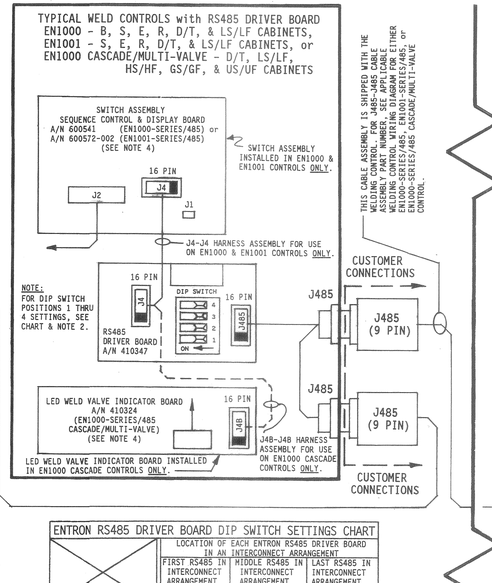
LAST RS485 & MIDDLE RS485'S

(Last RS485 Driver Board & Middle RS485 Driver Boards in Interconnect Arrangement)
SEE CHART & NOTE 2 & NOTE 7. Ⓒ



MIDDLE RS485

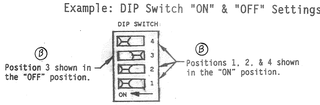
(Middle RS485 Driver Board in Interconnect Arrangement)
SEE CHART & NOTE 2 & NOTE 7. Ⓒ



ENTRON RS485 DRIVER BOARD DIP SWITCH SETTINGS CHART

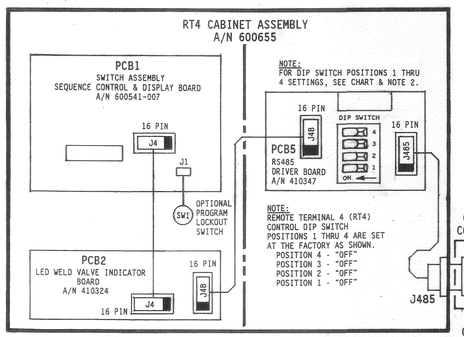
		LOCATION OF EACH ENTRON RS485 DRIVER BOARD IN AN INTERCONNECT ARRANGEMENT		
		FIRST RS485 IN INTERCONNECT ARRANGEMENT (Qty. One of RS485)	MIDDLE RS485 IN INTERCONNECT ARRANGEMENT (Qty. Of RS485 may vary)	LAST RS485 IN INTERCONNECT ARRANGEMENT (Qty. One of RS485)
DIP SWITCH POSITION FOR ON/OFF SETTING	POSITION 4	ON	OFF	ON
	POSITION 3	ON	OFF	OFF
	POSITION 2	OFF	OFF	ON
	POSITION 1	OFF	OFF	ON

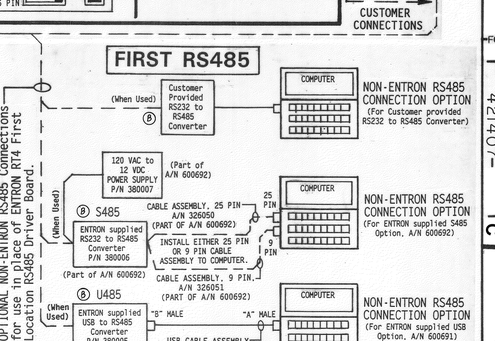
Example: DIP Switch "ON" & "OFF" Settings



MIDDLE RS485

(Middle RS485 Driver Board in Interconnect Arrangement)
SEE CHART & NOTE 2 & NOTE 7. Ⓒ





NOTICE

FOR SERVICE ON THIS CONTROL
Contact Your Machine Dealer Or
ENTRON CONTROLS LLC.
DIRECTLY: (864) 416-0190
601 HIGH TECH COURT
GREER, SC 29650
FAX# (864) 416-0195

DARK BAND INDICATES STRIPE ON HARNESS
J No.
INDICATES PLUG IN JACK

⚠ DANGER

HAZARDOUS VOLTAGE
FROM ONE OR MORE SOURCES
Turn off all voltage sources before touching any components.
Electrical shock or flash will cause severe injury or death.
Do not remove or cover this sign

REF: See Wiring Diagram #421406 for Remote Terminal 4 (RT4) Control for use with EN1000, EN1001, & EN1000 Cascade/Multi-Valve Controls.
See Application Note #700173 for Customer Assembly Instructions of Interconnect J485-J485 & J485-J485-J485 Cable Assembly's for external use between controls. (SEE NOTE 5).
See Wiring Diagram #421270-007 for EN1001-Series/485, "S" Cabinet.
See Wiring Diagram #421180-008 for EN1000-Series/485, "S" Cabinet.
See Wiring Diagram #421269-014 for EN1001-Series/485, "D/T/LS/LF" Cabinet.
See Wiring Diagram #421448 for U485 Converter Option. (For use with NON-ENTRON RS485 Devices).
See Wiring Diagram #421449 for S485 Converter Option. (For use with NON-ENTRON RS485 Devices).

REV	AUTH	DESCRIPTION	DRWN BY DATE	CHKD BY DATE
C	DCS 7/13/11	ADDED NOTE 7 FOR RT4jr.		
B	ECN 3091	IN P/L:RPW'D COMPONENTS 510250-003,550021,600050, & 540207 ADDED COMPONENTS 600691, 380005, 326049 600692, 380006, 380007 326050, 326051, & 700173 IN ENG/CHG'D DIP SWITCH POSITIONS, FIRST LOCATION POSITION 1 "OFF" WAS "ON", POSITION 2 "OFF" WAS "ON", & POSITION 3 "ON" WAS "OFF", LAST LOCATION POSITION 1 "ON" WAS "OFF", POSITION 2 "ON" WAS "OFF", & POSITION 3 "OFF" WAS "ON" IN LAST & MIDDLE RS485 DRIVER BOARD DIP SWITCH SETTINGS, ADDED "(X)" INDICATES NUMBER OF HELP (X)1000-SERIES/485 CASCADE/MULTI-VALVE CONTROLS" IN ENGR'G NOTE FOR RS485 CONNECTION OPTION VIEW-UPDATED NOTE 3 "DIP SWITCH SETTINGS" ..... NOTE 3 "ALTERNATE INTERCONNECT WIRING ARRANGEMENT" ..... NOTE 5 "J485 CABLE ASSEM....." & ADDED NOTE 6 "LOADING, TERMINATION, BIAS, & WIRE....."	DEC 10-23 01	DEC 10-23 01
A	2664	IN P/L:RPW'D RT4 MANUAL 700172;	DEC 4-27-04	DEC 4-27-04

REV	AUTH	DESCRIPTION	DRWN BY DATE	CHKD BY DATE
—	—	ORIGINAL RELEASE		

ENTRON CONTROLS INC

SCALE	DATE	DRAWN BY	CHK'D BY	APPROVED BY
NONE	10-15-99	DEC	DEC 10-15-99	

TOLERANCE UNLESS SPECIFIED
ANGLES: ± 1°
DECIMALS: ± .010
FRACTIONS: ± 1/64

REVISED
REV LTR: C
DATE: 7/13/11
APPROVED BY: DCS

WIRING DIAGRAM, INTERCONNECT WIRING of RS485 DRIVER BOARDS for use with RT4 (OBSOLETE) AND RT4jr. EN1000, EN1001, EN1000 CASCADE & EN1001 CASCADE CONTROLS

NEXT ASSM/USED ON

DRAWING NUMBER: 421407- REV: C

DRAWING NUMBER 421407- REV C

80184
22 x 34
12 ENTRON 470046