



Regent + Plus

PD 7901

I/O Termination Assembly (ITA)

RH/LH Varelco Connector and Screw
Terminal Versions

(T7901, T7902 and T7903)

Issue 1, March, 06

I/O Termination Assemblies (ITAs) are used in conjunction with I/O modules to enhance the field wiring philosophy of the Regent + Plus product range. The ITAs provide connector type conversion, analog conversion, panel break facilities and an ideal point for test signal injection. The ITAs can provide these facilities for all I/O modules with the exception of the Thermocouple, RTU, Relay and Isolated Guarded Output modules, which are wired in a conventional manner.

Features

- Rapid connection between I/O chassis and customer field devices
- Optional current to voltage conversion for active field devices
- Provides supply and return paths for field devices
- Right-hand Varelco version - T7901
- Left-hand Varelco version - T7902
- Screw terminal version (high voltage) - T7903
- Provides panel break facilities
- Uses standard cables
- Fault tolerant configurable

The ITAs provide rapid connection between I/O chassis and customer field wiring, using pre-formed cables which are wired on a one to one basis (ie. module pin 1 to ITA pin 1). A common supply path is provided, allowing common field/return and analog conversion via resistors.



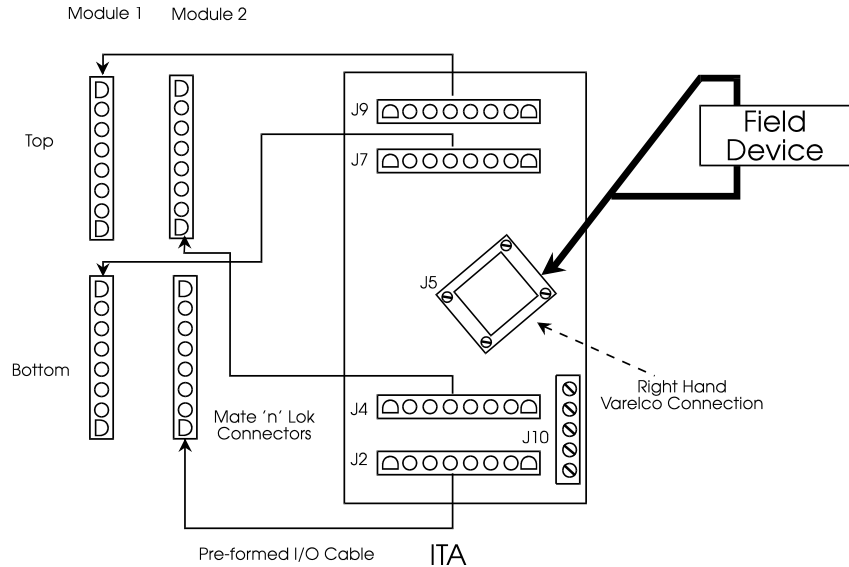


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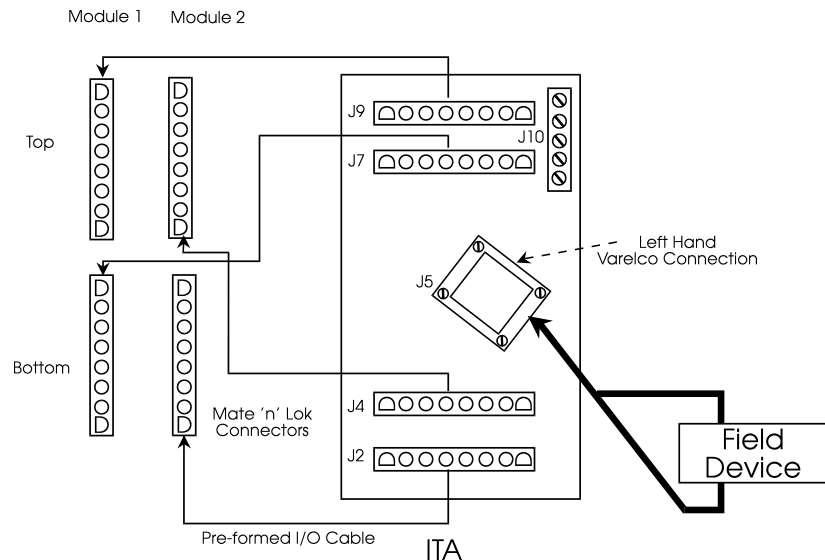
A Varelco version has been developed for low voltage applications and a screw terminal version for low and high voltage applications. Both types of ITA are TÜV Certified.

Only one ITA is required per redundant slice. There are three types of ITA:

- Varelco Connector Right Hand (Product Group T7901). Provides connection for low voltage right hand cable entry terminations. A typical example is shown below:

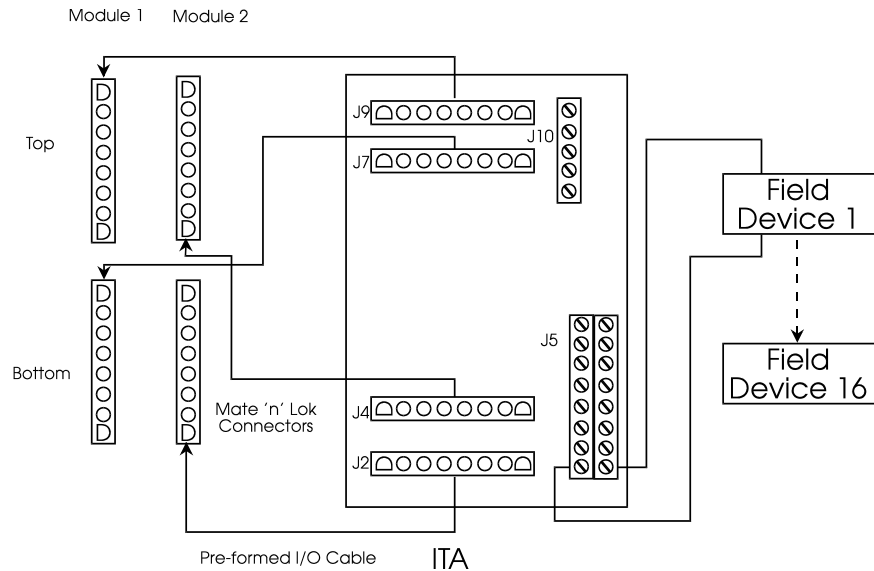


- Varelco Connector Left Hand (Product Group T7902). Provides connection for low voltage left hand cable entry terminations. A typical example is shown below:





- Screw Terminal (Product Group T7903). Provides screw terminal connection for low and high voltage applications. A typical example is shown below:



Each of the above has build variants to match the mode of operation of the individual Regent + Plus I/O modules:

- Differential, Field Loop
- Differential, Field Loop with Dioded Power Protection
- Single Ended, with No Current Limiting in Field Loop
- Single Ended, with No Current Limiting in Field Loop with Dioded Power Protection
- Single Ended, with Current Limiting in Field Loop with Dioded Power Protection
- Single Ended, Analog, Current Mode
- Differential, Analog, Current Mode
- Single Ended, with External Current Limiting (Floating Earth Systems)

Please refer to the Appendices for details of each build variant.

The ITAs are a standard size (170mm x 110mm) enabling a set area in the back of each panel to be allocated for ITA placement. ITAs can be grouped in order of voltage, ITA type, field zone, etc.

The ITAs are packaged in a DIN Rail mounting PCB Carrier to provide rapid assembly.

The Varelco versions of the ITAs have space allowance for a 90-Way hood to be used on the mounting half of the field marshaling cable.

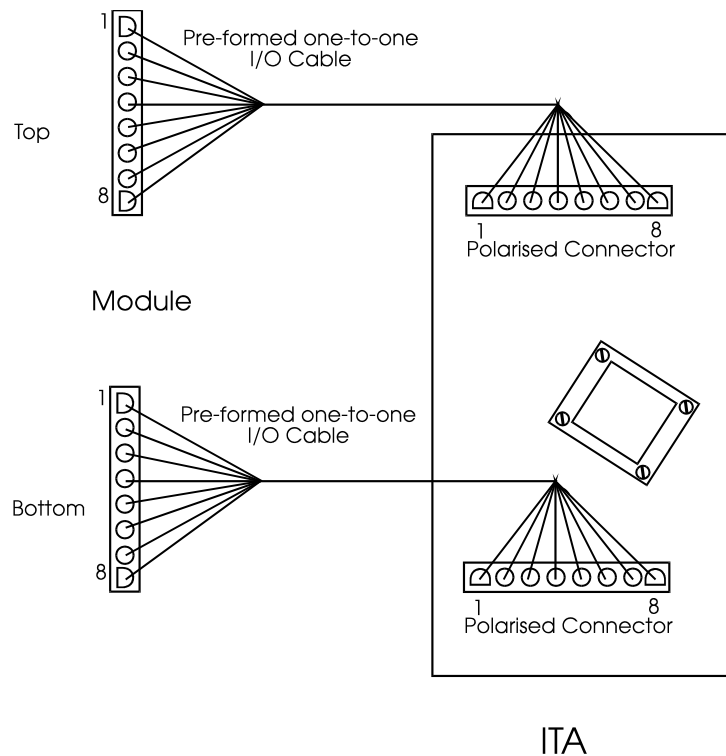


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The unused pins of the connector are tracked to a screw terminal on the PCB to allow the field cables and hoods to be grounded if required.

Module Operation

As shown below, pre-formed polarised I/O cables are connected between the I/O backplanes and ITA connectors J1/J2/J3/J4/J6/J7/J8/J9. Field cables are connected to J5 and common feed/returns and spare pin grounds are applied to connector J10 (screw terminals). With a Screw Terminal ITA, connector J5 would consist of a set of dual row screw terminals.



Pins 1 to 8 of the I/O Chassis 8-way connectors are wired one-to-one with pins 1 to 8 of the 8-way connectors on the ITA. Each connector on the ITA has pin identification shown on the legend of the ITA. Cross-mapping between the 8-way connectors on the ITA and the Varelco/Screw terminals is shown in the appendices. Where field sensor power is provided on single ended ITAs, the tables in the appendices show the field power connections and distribution.



Application

Table 1 shows the ITA type/variant to be used with each type of Regent + Plus I/O module.

Table 1 - Module / ITA Type

Module	ITA Product N°	ITA Type	Comments	
-	-	Differential Field Loop	Refer to Appendix A	
T7454	790310		Screw Terminal Only	
T7461A	790110 790210			
T7462A	790110 790210 790310		For voltages below 48Vdc For voltages above 48Vdc	
T7468A	790310		Screw Terminal Only	
T7470	790110 790210			
T7480	790110 790210			
T7420A	790110 790210		Differential Voltage Mode Differential Voltage Mode	
T7420AF	790110 790210			
-	-		Single Ended, No Current Limiting Field Loop	Refer to Appendix B
T7464	790311			Screw Terminal Only
T7481	790111			
T7484	790311	Screw Terminal Only		
T7488	790311	Screw Terminal Only		
T7411F	790111 790211			
T7411	790111 790211			
T7418F	790311	Screw Terminal Only		



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Table 1 (continued) - Module / ITA Type

Module	ITA Product N°	ITA Type	Comments	
-	-	Single Ended, No Current Limiting Field Loop	Refer to Appendix B	
T7444	790311		Screw Terminal Only	
T7401	790111 790211			Screw Terminal Only Screw Terminal Only
T7402	790111 790211			
T7408	790311			
T7404	790311			
T7441A	790111 790211			
T7420A	790111 790211			
T7420AF	790111 790211			
-	-	Single Ended, Current Limiting Dioded Supply		
T7401	790112 790212			
T7402	790112 790212			
T7441	790112 790212			
-	-	Single Ended, Analog Current Mode	Refer to Appendix D	
T7420A	790113 790213			
T7420AF	790113 790213			



Table 1 (continued) - Module / ITA Type

Module	ITA Product N°	ITA Type	Comments
-	-	Single Ended, External Current Limiting	Refer to Appendix E
T7411	790114 790214		Screw Terminal only
T7411F	790114 790214		
T7418F	790314		
T7401	790114 790214		
T7402	790114 790214		
T7408	790314		
T7404	790314		
T7420A	790114 790214		
T7420AF	790114 790214		
-	-		
T7420A	790115 790215		
T7420AF	790115 790215		
-	-	Differential, Field Loop with Dioded Power Protection	Refer to Appendix G
			Special Projects Future Use
-	-	Single Ended, No Current Limiting in Field Loop with Dioded Supply	Refer to Appendix H
			Special Projects Future Use



Specifications

Electrical Specification

Power Supply Requirements:	Dependent on I/O variant. Maximum values are given for reference.
T7901 & T7902	48VDC
T7903	120VAC/DC
Current Carrying Capacity:	16A Max (Total)
RFI Immunity:	27 to 500MHz at 10V/m (3 axes)
EMC:	400A/m at 50Hz (3 axes)

Mechanical Specification

Dimensions (mm)	Varelco: 170D x 110W x 65H Screw Terminal: 170D x 110W x 65H
Connector:	Varelco 8016 Series Screw Terminal GSED5/32
Weight:	Various
Operating Temperature:	0 to 60°C
Shock:	1/2 sine wave 6ms period, 10G peak (3 times) 3 axes
Vibration:	10 to 20Hz 0.5mm pp, 20 to 55Hz 1.0G peak in 3 axes
Relative Humidity:	0 to 95% non-condensing
H2S Exposure:	1ppm for 1 year with no damage



Appendix A - Differential, Field Loop

YTMR790110 (Right Hand Varelco Connector)

YTMR790210 (Left Hand Varelco Connector)

YTMR790310 (Screw Terminal Connector)

The Differential, Field Loop, ITA provides the facility to connect sixteen differential field circuits to the I/O modules. One Differential, Field Loop, ITA is capable of feeding two modules, as shown in the block diagrams below:

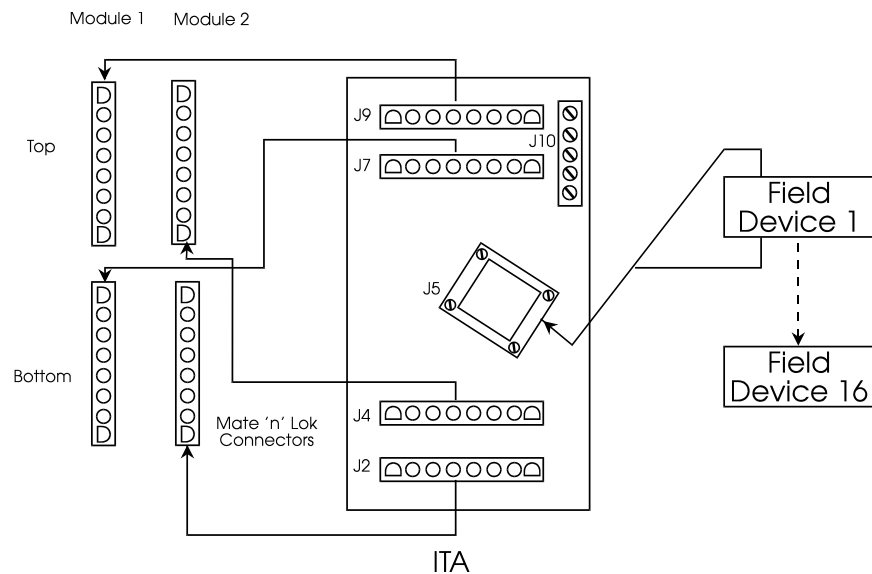
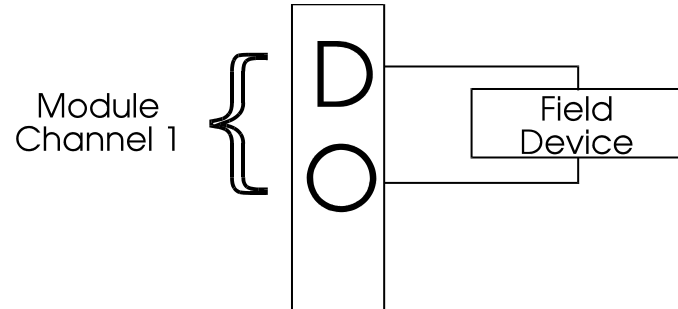


Figure A-1. Varelco Left Hand Differential, Field Loop, Block Diagram.



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The modules which use the Differential Field Loop ITA are listed in Table 1 of the main document. These modules function in a manner such that the field devices do not require a common feed or return, as illustrated below:



The connector idents are shown on the legend on the ITA.



The four 8-Way connectors are tracked to the connectors, as shown in Tables A-1 and A-2.

Table A-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J2	S1	C
J2	S2	D
J2	S3	H
J2	S4	J
J2	S5	M
J2	S6	N
J2	S7	S
J2	S8	T
J4	S1	A
J4	S2	B
J4	S3	E
J4	S4	F
J4	S5	K
J4	S6	L
J4	S7	P
J4	S8	R
J7	S1	AA
J7	S2	BB
J7	S3	EE
J7	S4	FF
J7	S5	KK
J7	S6	LL
J7	S7	PP
J7	S8	RR
J9	S1	Y
J9	S2	Z
J9	S3	CC
J9	S4	DD
J9	S5	HH



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J9	S6	JJ
J9	S7	MM
J9	S8	NN
J10	GND	U, V, W, X, SS, TT

Table A-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J2	S1	3
J2	S2	4
J2	S3	7
J2	S4	8
J2	S5	11
J2	S6	12
J2	S7	15
J2	S8	16
J4	S1	1
J4	S2	2
J4	S3	5
J4	S4	6
J4	S5	9
J4	S6	10
J4	S7	13
J4	S8	14
J7	S1	19
J7	S2	20
J7	S3	23
J7	S4	24
J7	S5	27
J7	S6	28
J7	S7	31
J7	S8	32
J9	S1	17
J9	S2	18

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J9	S3	21
J9	S4	22
J9	S5	25
J9	S6	26
J9	S7	29
J9	S8	30



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A set of five screw terminals on the Varelco variant of the ITA provides the facility to ground the spare Varelco pins and for the reference analog voltage to be connected to the I/O module (this facility specifically concerns the T7420 Analog Input Module when it is used with differential voltage input wiring). The detailed connections are listed in Table A-3.

Table A-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect to module AREF1 & AREF2. (T7420 only).
J10	B	Connect to AGND (T7420 only).
J10	C	Connect to J10 (GND) (T7420 only)
J10	D	No Connection.
J10	GND	Connect to ground if not used on T7420. If used on T7420, connect the Field Analog Ground to Pin TT of the Varelco Connector and link J10 GND to J10 Pin C.

A set of four screw terminals on the Screw Terminal variant of the ITA provides the facility for the reference voltage to be passed to the T7420 Analog Input Module. A circuit schematic is shown below and the detailed connections are listed in Table A-4.

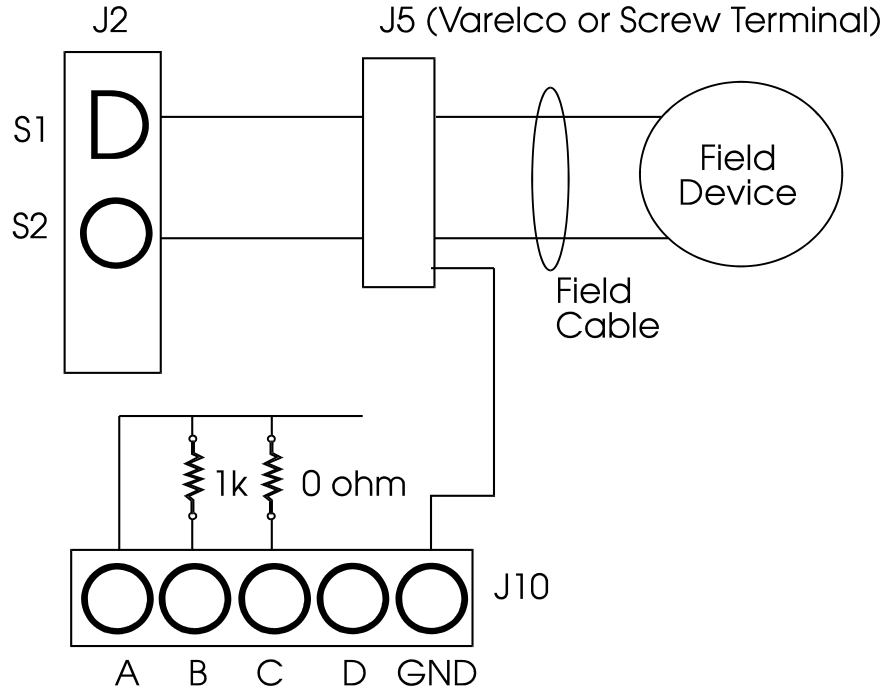


Table A-4. Screw Terminal J10 Connection Details.

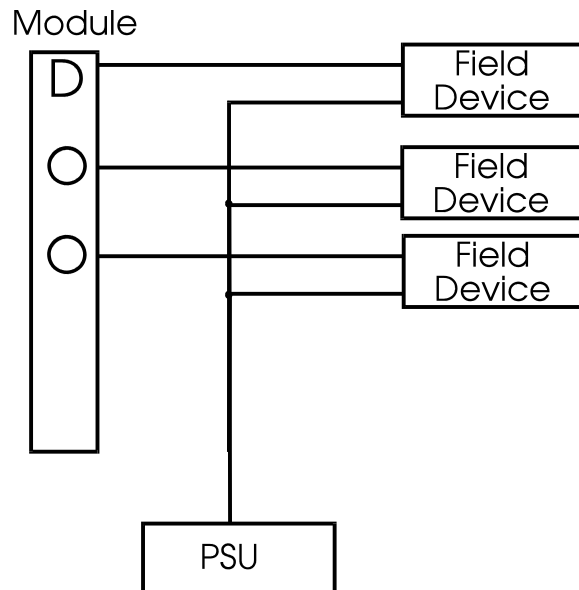
Connector Ident	Pin Ident	Comments
J10	A	Connect to AREF1/AREF2. (T7420 only)
J10	B	Connect to AGND. (T7420 only)
J10	C	Connect to Analog Ground AINGD. (T7420 only)
J10	D	Connect Cable Screen and Ground.



Appendix B - Single Ended, No Current Limiting, Field Loop

- YTMR790111 (Right Hand Varelco Connector)
- YTMR790211 (Left Hand Varelco Connector)
- YTMR790311 (Screw Terminal Connector)

The Single Ended, No Current Limiting, Field Loop ITA provides a method for supplying a common feed/return path to field devices on a per module basis, as shown below:



The single ended signal is fed from the I/O chassis to the ITA. The ITA provides a common supply which is tracked out on the ITA to provide each single ended signal with a feed/return supply path. Each field loop is capable of carrying 2A. The overall maximum current of the ITA should not exceed 16A total.

Single ended I/O modules have 16 field circuits and one ITA will be required for each module.

The connector idents are shown on the legend on the ITA.

The block diagrams below show typical connection of the module to the field device.

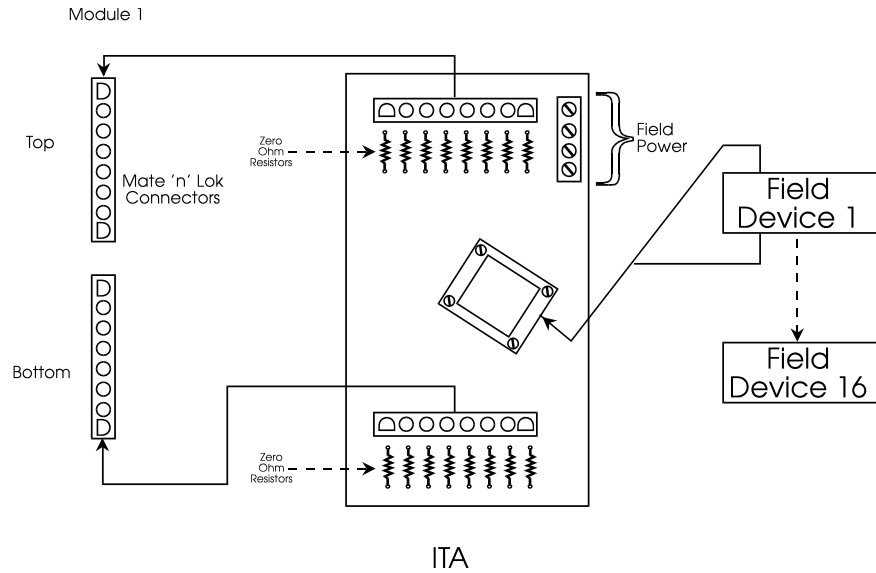


Figure B-1. Varelco Left Hand Single Ended, No Current Limiting, Field Loop, Block Diagram.

The modules which use the Single Ended, No Current Limiting Field Loop ITA are listed in Table 1 of the main document.

The two 8-Way connectors are tracked to the connectors. as shown in Tables B-1 and B-2.



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Table B-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	A
J10	Common Return / Feed (A)	B
J3	S2	C
J10	A	D
J3	S3	E
J10	A	F
J3	S4	H
J10	A	J
J3	S5	K
J10	A	L
J3	S6	M
J10	A	N
J3	S7	P
J10	A	R
J3	S8	S
J10	A	T
J8	S1	Y
J10	A	Z
J8	S2	AA
J10	A	BB
J8	S3	CC
J10	A	DD
J8	S4	EE
J10	A	FF
J8	S5	HH
J10	A	JJ
J8	S6	KK
J10	A	LL
J8	S7	MM
J10	A	NN



J8	S8	PP
J10	A	RR
J10	GND	U, V, W, X, SS, TT

Table B-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	1
J10	Common Return / Feed (A)	2
J3	S2	3
J10	A	4
J3	S3	5
J10	A	6
J3	S4	7
J10	A	8
J3	S5	9
J10	A	10
J3	S6	11
J10	A	12
J3	S7	13
J10	A	14
J3	S8	15
J10	A	16
J8	S1	17
J10	A	18
J8	S2	19
J10	A	20
J8	S3	21
J10	A	22
J8	S4	23
J10	A	24
J8	S5	25
J10	A	26



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J8	S6	27
J10	A	28
J8	S7	29
J10	A	30
J8	S8	31
J10	A	32

A set of five screw terminals on the Varelco variant of the ITA provides the facility to connect the common feed/return supply, ground spare Varelco pins and connecting the reference voltage of analog I/O modules (T7420) when using single ended wiring. The detailed connections are listed in Table B-3.

Table B-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect common feed/return supply.
J10	B	Connect to AGND (T7420 only) .
J10	C	Connect AREF1 & AREF2 (T7420 only).
J10	D	No Connection.
J10	GND	Connect to Ground.

The connections for the Screw Terminal Variant are the same as above, with the exception that there are no J10 GND connections as there are no spare connections which require grounding. A circuit schematic is shown below.

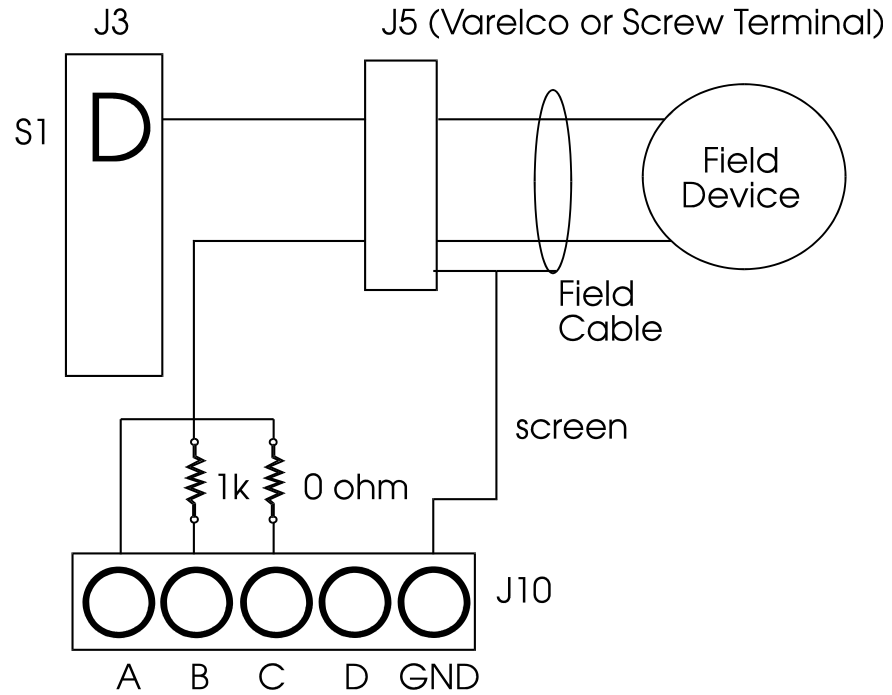


Table B-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect common feed/return supply.
J10	B	Connect to AGND (T7420 only) .
J10	C	Connect AREF1 & AREF2 (T7420 only).
J10	D	Cable Screen and GND.



Appendix C - Single Ended, Current Limiting, Field Loop With Dioded Power Protection (24V)

YTMR790112	(Right Hand Varelco Connector)
YTMR790212	(Left Hand Varelco Connector)
YTMR790312	(Screw Terminal Connector)

The Single Ended, Current Limiting, Field Loop ITA provides the facility to provide a method for supplying a common feed/return path to field devices on a per module basis, as shown below. The ITA has a 2k Ω , 5%, 1.6W resistor in the common feed/return path. The resistor is designed to blow open circuit if too much power is dissipated through it.

The Single ended, Current Limiting Field Loop ITA should NOT be used with the T7420 Analog Input Module.

The single ended signal is fed from the I/O chassis to the ITA. The ITA provides a common dioded supply which is tracked out on the ITA to provide each single ended signal with a current limited feed/return supply path. The overall maximum current of the ITA should not exceed 2.5A total if current is supplied via diodes or 16A total if supplied via J10.

Single ended I/O modules have 16 field circuits and one ITA will be required for each module.

The connector idents are shown on the legend on the ITA.

The block diagram below shows typical connection of the module to the field device.

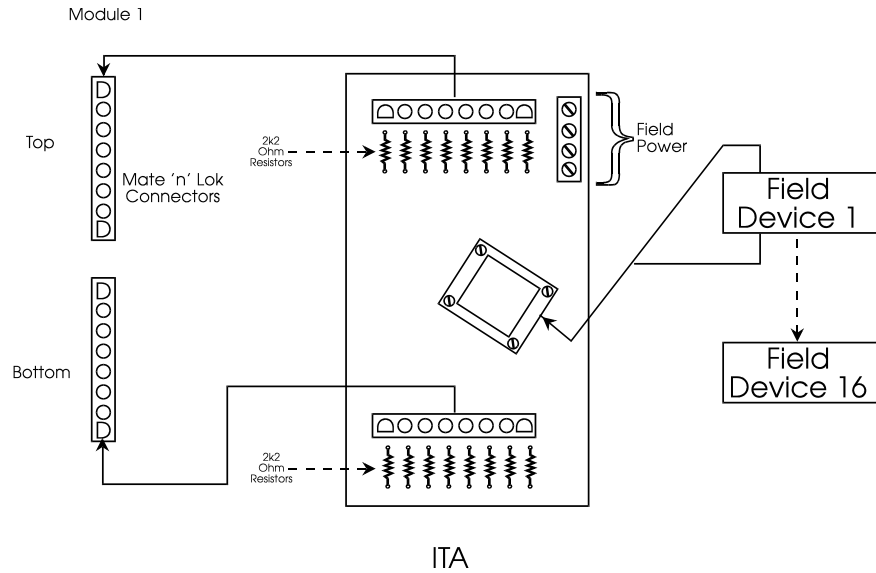


Figure C-1. Varelco Left Hand Single Ended, Current Limiting, Field Loop With Dioded Power Protection, Block Diagram.

The modules which use the Single Ended, Current Limiting Field Loop ITA are listed in Table 1 of the main document.

The two 8-Way connectors are tracked to the connectors. as shown in Tables C-1 and C-2.



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Table C-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	A
J10	Common Return / Feed (A)	B
J3	S2	C
J10	A	D
J3	S3	E
J10	A	F
J3	S4	H
J10	A	J
J3	S5	K
J10	A	L
J3	S6	M
J10	A	N
J3	S7	P
J10	A	R
J3	S8	S
J10	A	T
J8	S1	Y
J10	A	Z
J8	S2	AA
J10	A	BB
J8	S3	CC
J10	A	DD
J8	S4	EE
J10	A	FF
J8	S5	HH
J10	A	JJ
J8	S6	KK
J10	A	LL
J8	S7	MM
J10	A	NN



J8	S8	PP
J10	A	RR
J10	GND	U, V, W, SS, TT

Table C-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	1
J10	Common Return / Feed (A)	2
J3	S2	3
J10	A	4
J3	S3	5
J10	A	6
J3	S4	7
J10	A	8
J3	S5	9
J10	A	10
J3	S6	11
J10	A	12
J3	S7	13
J10	A	14
J3	S8	15
J10	A	16
J8	S1	17
J10	A	18
J8	S2	19
J10	A	20
J8	S3	21
J10	A	22
J8	S4	23
J10	A	24
J8	S5	25
J10	A	26



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J8	S6	27
J10	A	28
J8	S7	29
J10	A	30
J8	S8	31
J10	A	32

A set of five screw terminals on the Varelco variant of the ITA provides the facility to connect the common feed/ return supply and ground spare Varelco pins. The detailed connections are listed in Table C-3.

Table C-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect common feed/return supply.
J10	B	Power 1 In.
J10	C	Power 2 In.
J10	D	Power 3 In.
J10	GND	Connect to ground.

The connections for the Screw Terminal Variant are the same as above, with the exception that there are no J10 GND connections as there are no spare connections which require grounding. A circuit schematic is shown below.

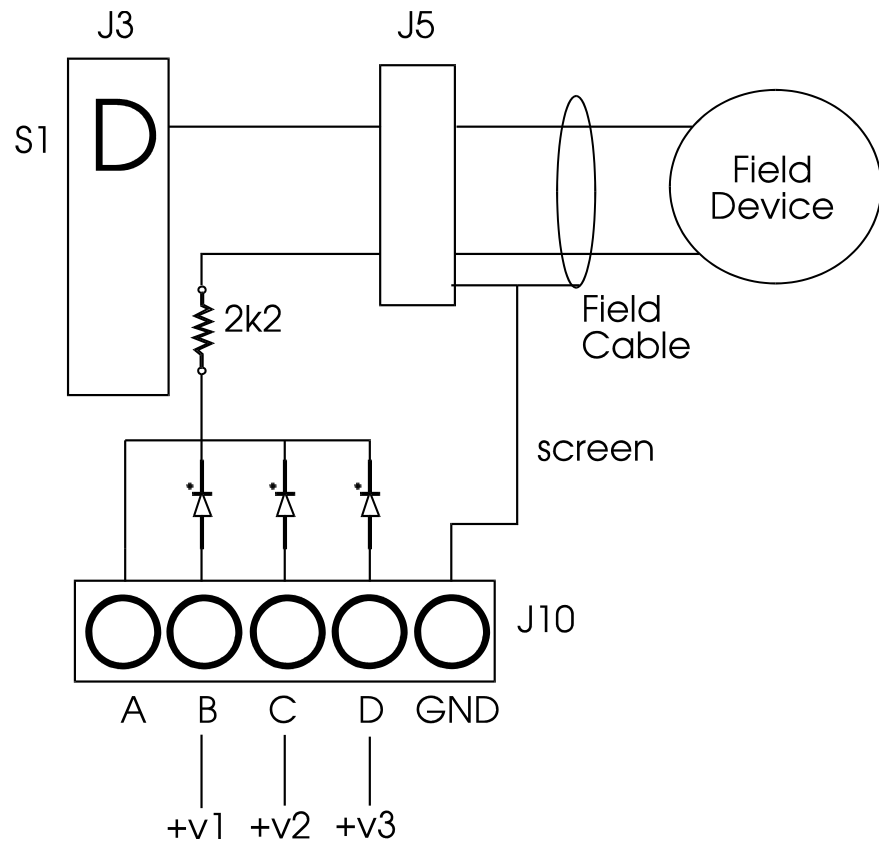


Table C-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect common feed/return supply.
J10	B	Power 1 in.
J10	C	Power 2 in.
J10	D	Power 3 in.



Appendix D - Single Ended, Analog, Current Mode

- YTMR790113 (Right Hand Varelco Connector)
- YTMR790213 (Left Hand Varelco Connector)
- YTMR790313 (Screw Terminal Connector)

The Single Ended, Analog, Current Mode ITA is used only in conjunction with the T7420 Analog Input Module when it is employing a single ended current input wiring philosophy. The ITA provides the facility for the current conversion required. The ITA is capable of handling 16 single ended signals.

Single ended I/O modules have 16 field circuits and one ITA will be required for each module.

The connector idents are shown on the legend on the ITA.

The block diagram below shows typical connection of the module to the field device.

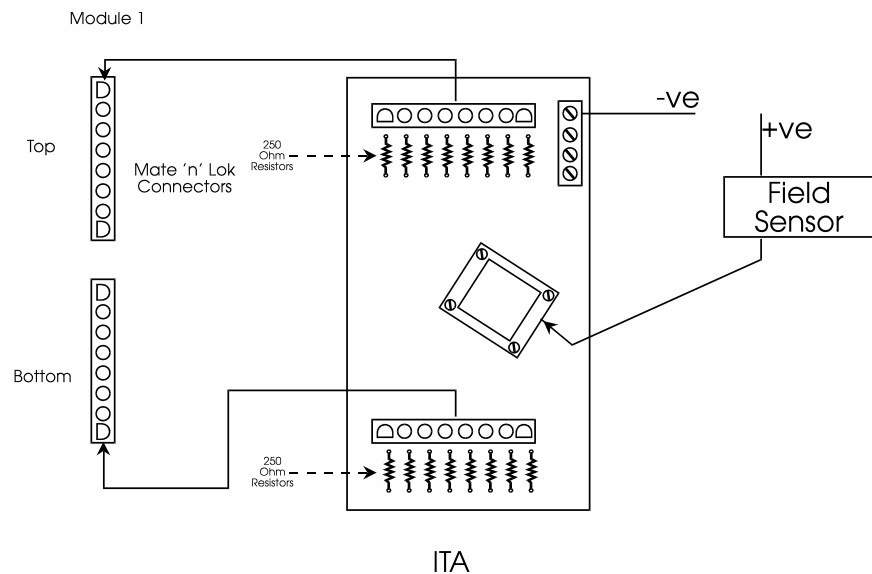


Figure D-1. Varelco Left Hand Single Ended, Analog, Current Mode, Block Diagram.

The modules which use the Single Ended, Analog, Current Mode ITA are listed in Table 1 of the main document.



The two 8-Way connectors are tracked to the connectors. as shown in Tables D-1 and D-2.

Table D-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	A
J1	S1	B
J3	S2	C
J1	S2	D
J3	S3	E
J1	S3	F
J3	S4	H
J1	S4	J
J3	S5	K
J1	S5	L
J3	S6	M
J1	S6	N
J3	S7	P
J1	S7	R
J3	S8	S
J1	S8	T
J8	S1	Y
J6	S1	Z
J8	S2	AA
J6	S2	BB
J8	S3	CC
J6	S3	DD
J8	S4	EE
J6	S4	FF
J8	S5	HH
J6	S5	JJ
J8	S6	KK
J6	S6	LL
J8	S7	MM



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J6	S7	NN
J8	S8	PP
J6	S8	RR
J10	GND	TT, V, W, X, SS, FT

Table D-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	1
J1	S1	2
J3	S2	3
J1	S2	4
J3	S3	5
J1	S3	6
J3	S4	7
J1	S4	8
J3	S5	9
J1	S5	10
J3	S6	11
J1	S6	12
J3	S7	13
J1	S7	14
J3	S8	15
J1	S8	16
J8	S1	17
J6	S1	18
J8	S2	19
J6	S2	20
J8	S3	21
J6	S3	22
J8	S4	23
J6	S4	24
J8	S5	25
J6	S5	26

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J8	S6	27
J6	S6	28
J8	S7	29
J6	S7	30
J8	S8	31
J6	S8	32



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A set of five screw terminals on the Varelco variant of the ITA provides the facility to connect the negative supply, AGND, AREF and to ground the spare Varelco pins.. The detailed connections are listed in Table D-3.

Table D-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect to AREF1/AREF2.
J10	B	Connect AGND.
J10	C	Connect to Field Power Supply Return.
J10	D	No Connection.
J10	GND	No Connection.

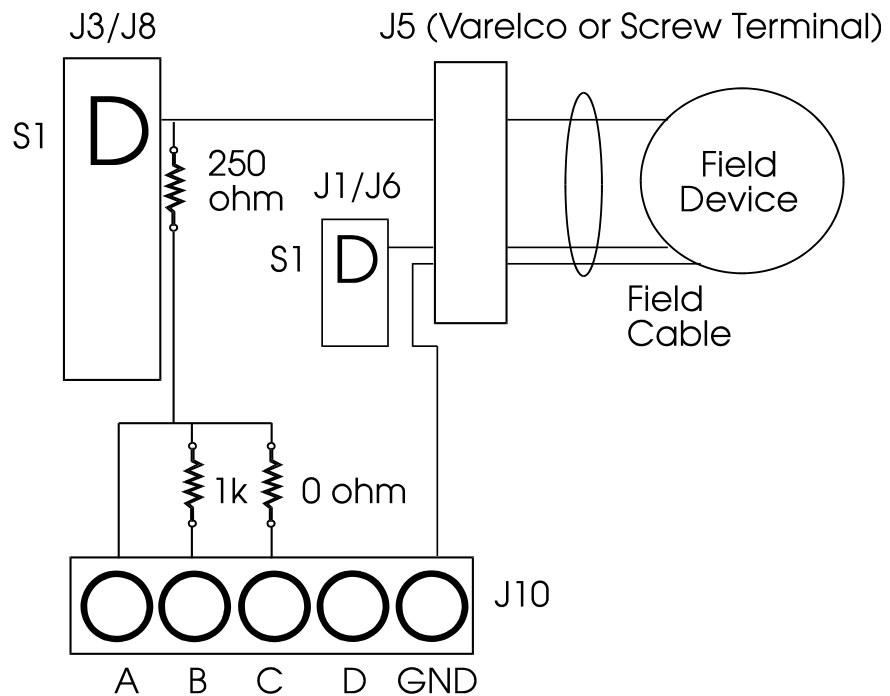




Table D-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect to AREF1/AREF2.
J10	B	Connect AGND.
J10	C	Connect to Field Power Supply Return.
J10	D	Cable Screen and GND.



Appendix E - Single Ended, External Current Limiting

- YTMR790114 (Right Hand Varelco Connector)
- YTMR790214 (Left Hand Varelco Connector)
- YTMR790314 (Screw Terminal Connector)

The Single Ended, External Current Limiting ITA provides the facility for fusing each path of the field loop when using single ended modules. The ITA is capable of handling 16 single ended signals. Each field circuit has a maximum current rating of 2A.

Single ended I/O modules have 16 field circuits and one ITA will be required for each module.

The connector idents are shown on the legend on the ITA.

The block diagram below shows typical connection of the module to the field device.

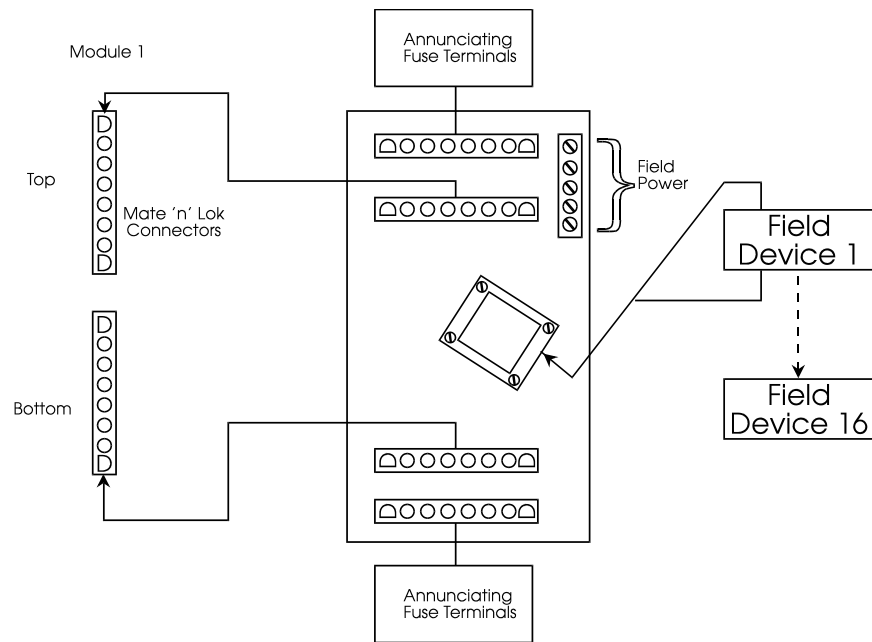


Figure E-1. Varelco Left Hand Single Ended, External Current Limiting, Block Diagram.

The modules which use the Single Ended, External Current Limiting ITA are listed in Table 1 of the main document.



The four 8-Way connectors are tracked to the connectors, as shown in Tables E-1 and E-2.

Table E-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	A
J1	S1	B
J3	S2	C
J1	S2	D
J3	S3	E
J1	S3	F
J3	S4	H
J1	S4	J
J3	S5	K
J1	S5	L
J3	S6	M
J1	S6	N
J3	S7	P
J1	S7	R
J3	S8	S
J1	S8	T
J9	S1	Y
J7	S1	Z
J9	S2	AA
J7	S2	BB
J9	S3	CC
J7	S3	DD
J9	S4	EE
J7	S4	FF
J9	S5	HH
J7	S5	JJ
J9	S6	KK
J7	S6	LL
J9	S7	MM



I/O Termination Assembly

J7	S7	NN
J9	S8	PP
J7	S8	RR
J10	GND	U, V, W, X, SS, TT



Table E-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	1
J1	S1	2
J3	S2	3
J1	S2	4
J3	S3	5
J1	S3	6
J3	S4	7
J1	S4	8
J3	S5	9
J1	S5	10
J3	S6	11
J1	S6	12
J3	S7	13
J1	S7	14
J3	S8	15
J1	S8	16
J8	S1	17
J6	S1	18
J8	S2	19
J6	S2	20
J8	S3	21
J6	S3	22
J8	S4	23
J6	S4	24
J8	S5	25
J6	S5	26
J8	S6	27
J6	S6	28
J8	S7	29
J6	S7	30
J8	S8	31



I/O Termination Assembly

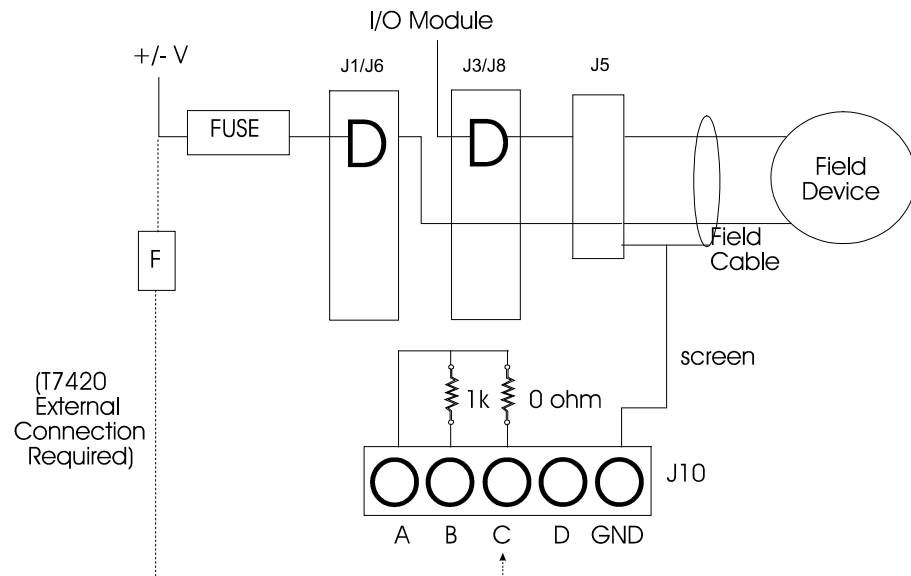
J6	S8	32
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A set of five screw terminals on the Varelco variant of the ITA provides the facility to connect to ground the spare Varelco pins. This ITA can be used with T7420 when using differential voltage input wiring. The detailed connections are listed in Table E-3.

Table E-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect AREF1 and AREF2.
J10	B	Connect AGND (T7420).
J10	C	Connect Fused Common Return (T7420).
J10	D	No Connection.
J10	GND	Connect to ground.





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Table E-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect AREF1 and AREF2.
J10	B	AGND (T7420).
J10	C	Connect Fused Common Return
J10	D	Cable Screen and GND.



Appendix F - Differential, Analog Current Mode

YTMR790115 (Right Hand Varelco Connector)

YTMR790215 (Left Hand Varelco Connector)

YTMR790315 (Screw Terminal Connector)

The Differential, Analog Current Mode, ITA provides the facility to connect sixteen differential field circuits to the I/O modules. One Differential, Field Loop, ITA is capable of feeding two modules, as shown in the block diagrams below:

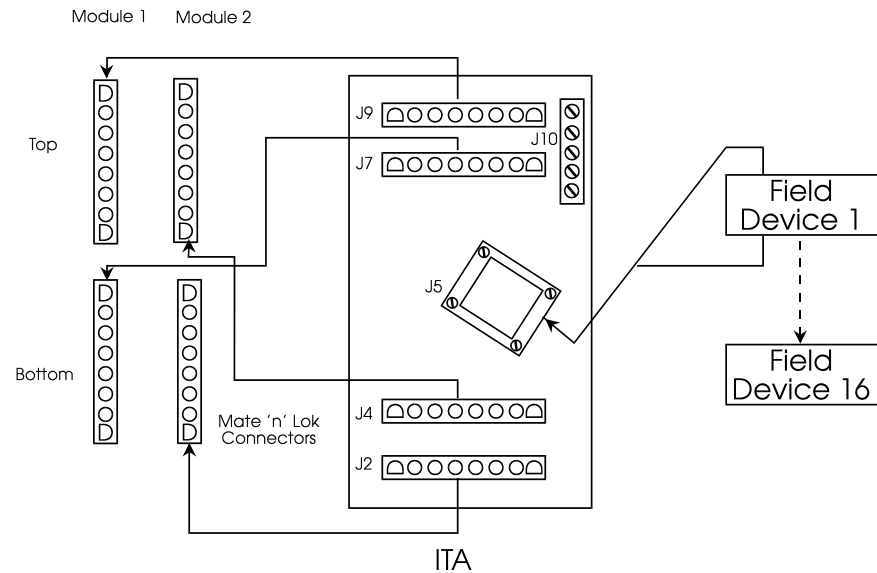
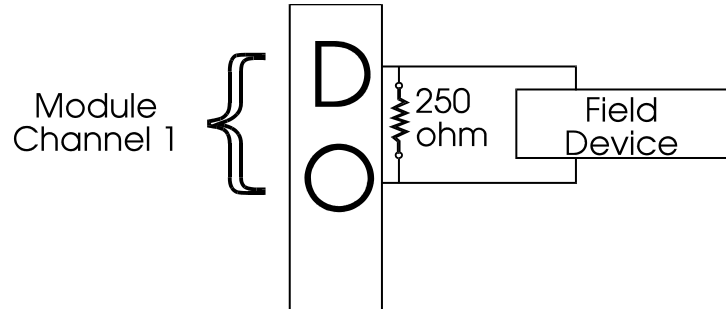


Figure F-1. Varelco Left Hand Differential, Analog Current Mode, Block Diagram.



I/O Termination Assembly

This ITA is used with the T7420 modules when in Differential Current Mode. The modules function in a manner such that the field devices require a 250 ohm resistor across its path, as illustrated below:



The connector idents are shown on the legend on the ITA.



The four 8-Way connectors are tracked to the connectors, as shown in Tables F-1 and F-2.

Table F-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J2	S1	C
J2	S2	D
J2	S3	H
J2	S4	J
J2	S5	M
J2	S6	N
J2	S7	S
J2	S8	T
J4	S1	A
J4	S2	B
J4	S3	E
J4	S4	F
J4	S5	K
J4	S6	L
J4	S7	P
J4	S8	R
J7	S1	AA
J7	S2	BB
J7	S3	EE
J7	S4	FF
J7	S5	KK
J7	S6	LL
J7	S7	PP
J7	S8	RR
J9	S1	Y
J9	S2	Z
J9	S3	CC
J9	S4	DD
J9	S5	HH



I/O Termination Assembly

J9	S6	JJ
J9	S7	MM
J9	S8	NN
J10	GND	U, V, W, X, SS, TT

Table F-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J2	S1	3
J2	S2	4
J2	S3	7
J2	S4	8
J2	S5	11
J2	S6	12
J2	S7	15
J2	S8	16
J4	S1	1
J4	S2	2
J4	S3	5
J4	S4	6
J4	S5	9
J4	S6	10
J4	S7	13
J4	S8	14
J7	S1	19
J7	S2	20
J7	S3	23
J7	S4	24
J7	S5	27
J7	S6	28
J7	S7	31
J7	S8	32
J9	S1	17
J9	S2	18

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J9	S3	21
J9	S4	22
J9	S5	25
J9	S6	26
J9	S7	29
J9	S8	30



I/O Termination Assembly

A set of five screw terminals on the Varelco variant of the ITA provides the facility to ground the spare Varelco pins and for the reference analog voltage to be connected to the I/O module. The detailed connections are listed in Table F-3.

Table F-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect to module AREF1 & AREF2.
J10	B	Connect to AGND (T7420 only).
J10	C	Link to Field Supply Return.
J10	D	No Connection.
J10	GND	No Connection.

A set of four screw terminals on the Screw Terminal variant of the ITA provides the facility for the reference voltage to be passed to the T7420 Analog Input Module. A circuit schematic is shown below and the detailed connections are listed in Table F-4.

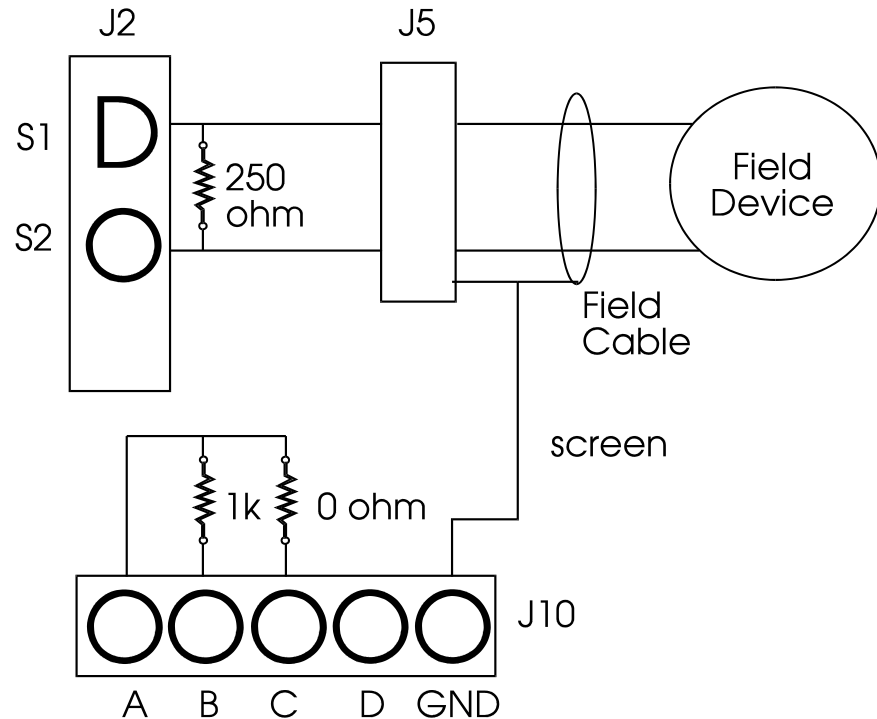


Table F-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Connect to AREF1 & 2.
J10	B	Connect to AGND.
J10	C	Connect to Field Supply Return.
J10	D	No Connection.



Appendix G - Differential, Field Loop With Dioded Power Protection

- YTMR790116 (Right Hand Varelco Connector)
- YTMR790216 (Left Hand Varelco Connector)
- YTMR790316 (Screw Terminal Connector)

The Differential, Field Loop with Dioded Power Protection, ITA provides the facility to connect sixteen differential field circuits to the I/O modules. One Differential, Field Loop, ITA is capable of feeding two modules, as shown in the block diagrams below:

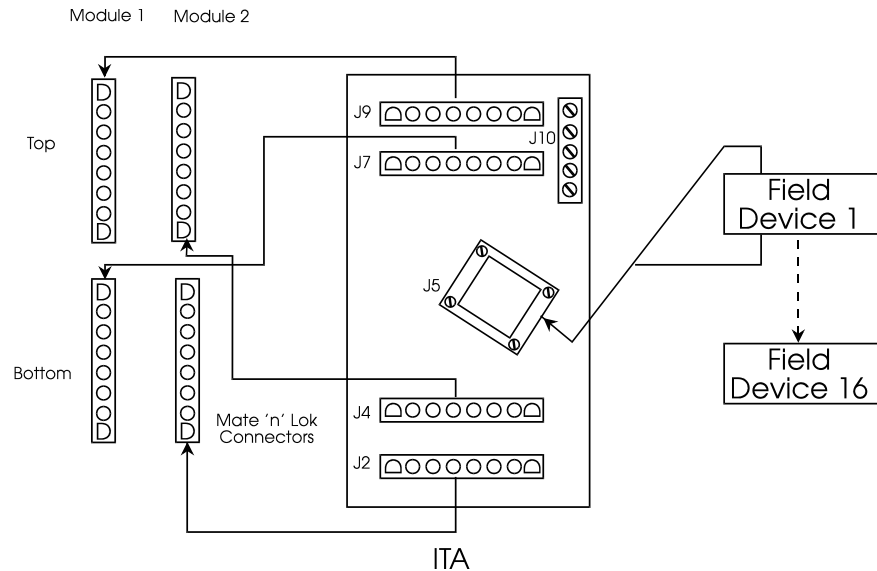
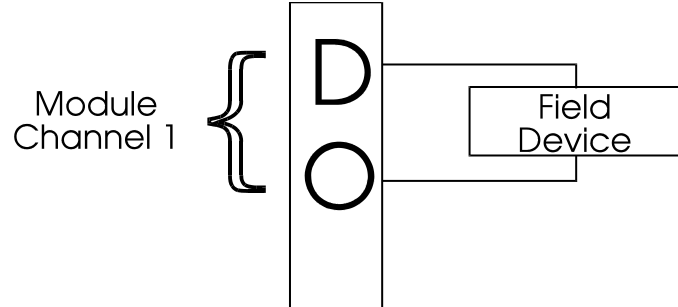


Figure G-1. Varelco Left Hand Differential, Field Loop with Dioded Power Protection, Block Diagram.



The modules which use the Differential Field Loop with Diode Power Protection ITA are listed in Table 1 of the main document. These modules function in a manner such that the field devices do not require a common feed or return, as illustrated below:



The connector idents are shown on the legend on the ITA.



I/O Termination Assembly

The four 8-Way connectors are tracked to the connectors, as shown in Tables G-1 and G-2.

Table G-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J2	S1	C
J2	S2	D
J2	S3	H
J2	S4	J
J2	S5	M
J2	S6	N
J2	S7	S
J2	S8	T
J4	S1	A
J4	S2	B
J4	S3	E
J4	S4	F
J4	S5	K
J4	S6	L
J4	S7	P
J4	S8	R
J7	S1	AA
J7	S2	BB
J7	S3	EE
J7	S4	FF
J7	S5	KK
J7	S6	LL
J7	S7	PP
J7	S8	RR
J9	S1	Y
J9	S2	Z
J9	S3	CC
J9	S4	DD
J9	S5	HH



J9	S6	JJ
J9	S7	MM
J9	S8	NN
J10	GND	U, V, W, X, SS, TT

Table G-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J2	S1	3
J2	S2	4
J2	S3	7
J2	S4	8
J2	S5	11
J2	S6	12
J2	S7	15
J2	S8	16
J4	S1	1
J4	S2	2
J4	S3	5
J4	S4	6
J4	S5	9
J4	S6	10
J4	S7	13
J4	S8	14
J7	S1	19
J7	S2	20
J7	S3	23
J7	S4	24
J7	S5	27
J7	S6	28
J7	S7	31
J7	S8	32
J9	S1	17
J9	S2	18



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J9	S3	21
J9	S4	22
J9	S5	25
J9	S6	26
J9	S7	29
J9	S8	30



A set of five screw terminals on the Varelco variant of the ITA provides the facility to ground the spare Varelco pins. The detailed connections are listed in Table G-3.

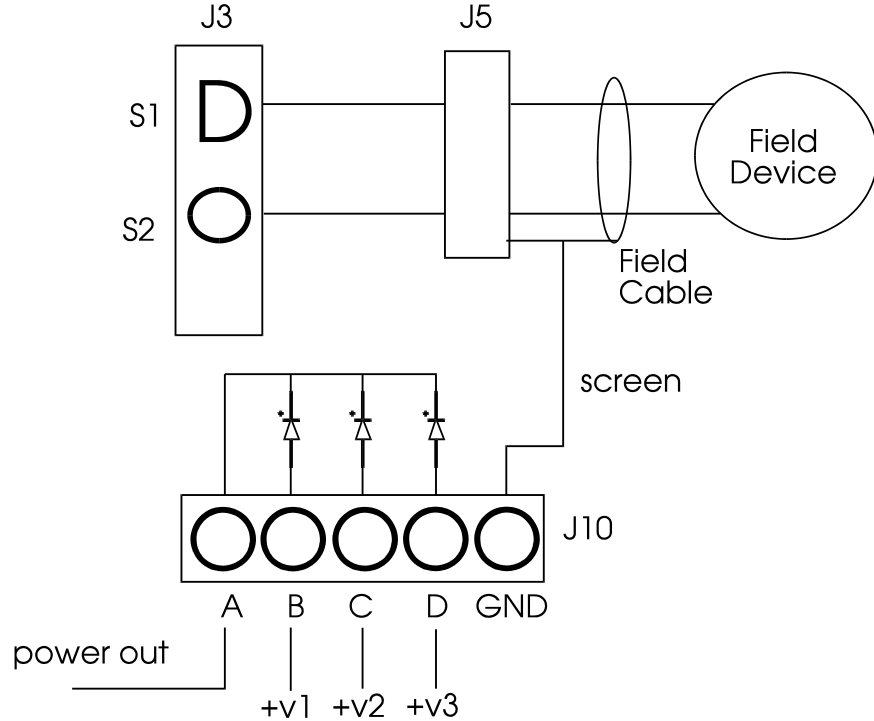
Table G-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Diode Protected Power Out.
J10	B	Power 1 In
J10	C	Power 2 In
J10	D	Power 3 In
J10	GND	Connect to ground



I/O Termination Assembly

A set of four screw terminals on the Screw Terminal variant of the ITA provides the facility for the reference voltage to be passed to the T7420 Analog Input Module. A circuit schematic is shown below and the detailed connections are listed in Table G-4.



The maximum protected current is 2.5A total, with any configuration of redundant supply.

Table G-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Diode Protected Power Out.
J10	B	Power 1 In.
J10	C	Power 2 In.
J10	D	Power 3 In



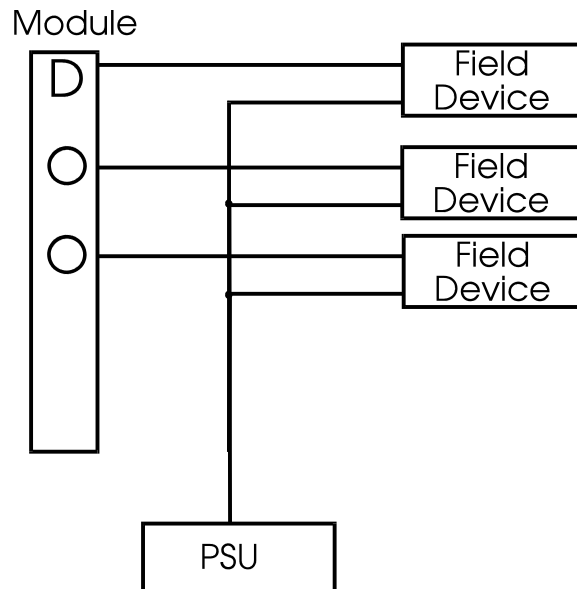
Appendix H - Single Ended, No Current Limiting, Field Loop With Dioded Power Protection

YTMR790117 (Right Hand Varelco Connector)

YTMR790217 (Left Hand Varelco Connector)

YTMR790317 (Screw Terminal Connector)

The Single Ended, No Current Limiting, Field Loop With Dioded Power Protection ITA provides a method for supplying a common feed/return path to field devices on a per module basis, as shown below:



The single ended signal is fed from the I/O chassis to the ITA. The ITA provides a common supply which is tracked out on the ITA to provide each single ended signal with a feed/return supply path. The overall maximum current of the ITA should not exceed 2.5A in any redundant power configuration where diodes are used or 16A total where power is supplied to field loops via J10 Pin A (diodes not used).

Single ended I/O modules have 16 field circuits and one ITA will be required for each module.

The connector idents are shown on the legend on the ITA.

The block diagrams below show typical connection of the module to the field device.



I/O Termination Assembly

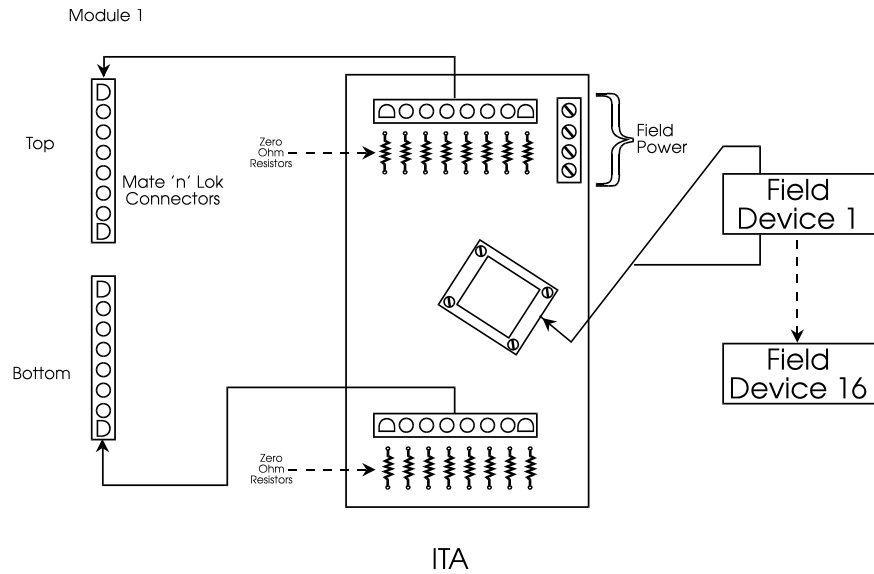


Figure H-1. Varelco Left Hand Single Ended, No Current Limiting, Field Loop With Diode Power Protection, Block Diagram.

The modules which use the Single Ended, No Current Limiting Field Loop With Diode Power Protection ITA are listed in Table 1 of the main document.

The two 8-Way connectors are tracked to the connectors. as shown in Tables H-1 and H-2.



Table H-1. Varelco Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	A
J10	Common Return / Feed (A)	B
J3	S2	C
J10	A	D
J3	S3	E
J10	A	F
J3	S4	H
J10	A	J
J3	S5	K
J10	A	L
J3	S6	M
J10	A	N
J3	S7	P
J10	A	R
J3	S8	S
J10	A	T
J8	S1	Y
J11	A	Z
J8	S2	AA
J11	A	BB
J8	S3	CC
J11	A	DD
J8	S4	EE
J11	A	FF
J8	S5	HH
J11	A	JJ
J8	S6	KK
J11	A	LL
J8	S7	MM
J11	A	NN



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J8	S8	PP
J11	A	RR
J10	GND	U, V, W, X, SS, TT

Table H-2. Screw Terminal Connections.

Connector	Pin Ident	Connector (J5) Pin
J3	S1	1
J10	Common Return / Feed (A)	2
J3	S2	3
J10	A	4
J3	S3	5
J10	A	6
J3	S4	7
J10	A	8
J3	S5	9
J10	A	10
J3	S6	11
J10	A	12
J3	S7	13
J10	A	14
J3	S8	15
J10	A	16
J8	S1	17
J11	A	18
J8	S2	19
J11	A	20
J8	S3	21
J11	A	22
J8	S4	23
J11	A	24
J8	S5	25
J11	A	26



J8	S6	27
J11	A	28
J8	S7	29
J11	A	30
J8	S8	31
J11	A	32

A set of five screw terminals on the Varelco variant of the ITA provides the facility to connect the common feed/ return supply and ground spare Varelco pins. The detailed connections are listed in Table H-3.

Table H-3. Varelco J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Power In/Out
J10	B	Power 1 In
J10	C	Power 2 In
J10	D	Power 3 In
J10	GND	Connect to ground.

The connections for the Screw Terminal Variant are the same as above, with the exception that there are no J10 GND connections as there are no spare connections which require grounding. A circuit schematic is shown below.



I/O Termination Assembly

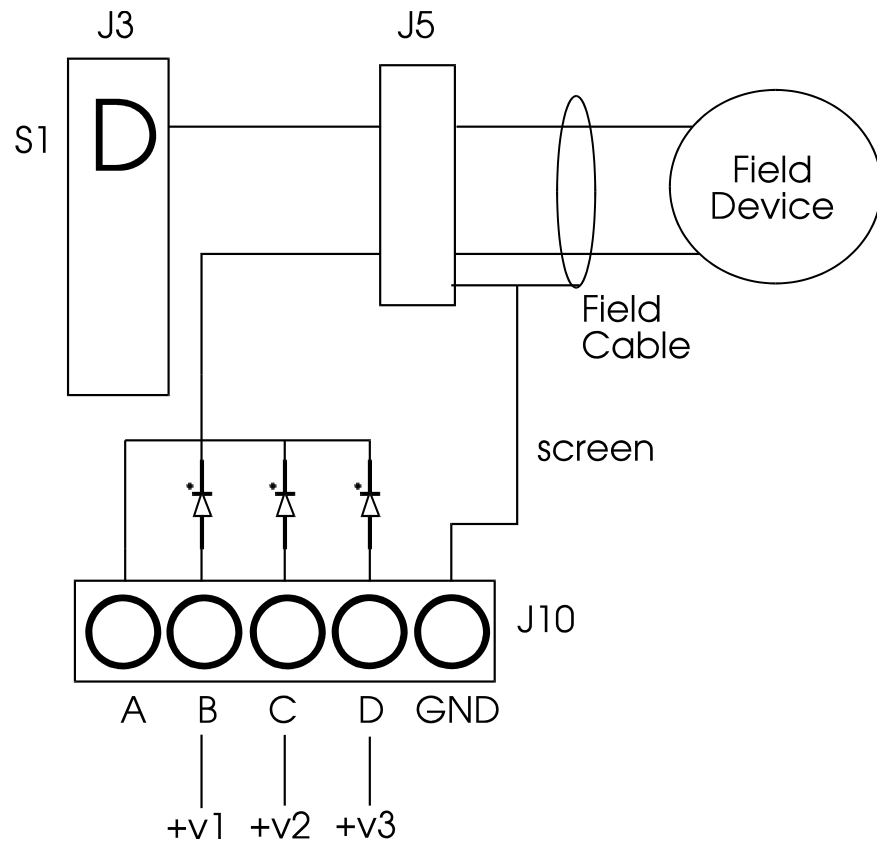


Table H-4. Screw Terminal J10 Connection Details.

Connector Ident	Pin Ident	Comments
J10	A	Power In/Out.
J10	B	Power 1 in .
J10	C	Power 2 in.
J10	D	Power 3 in.