

## L0RS0101 Obelix Proportional Solenoid Module Ex ib Intrinsically Safe I/O Dual Resolver Type A

The Obelix Mining PLC I.S. I/O Module provides intrinsically safe (Group I Ex ib) input and output resources in a single, compact unit.

A unique fiber-optic communications interface means that the module and dedicated I.S. power supply can be conveniently segregated into its isolated zone.

The fiber-optic link between the module and an Obelix processor module provides real-time control and monitoring of all I/O points.

This solution is ideal for mobile mining equipment where limited installation space must be managed.

Uniquely Keyed Type Connectors to prevent incorrect machine installation.

**The module is Dual Obelix Type which complies with AS/NZS 4240 standard.**

**As per standard, every output includes two switches A&B in series with monitoring feedbacks from both.**

**Extra safety is achieved by using two potted boards where each includes main and watchdog processors monitoring the correctness of executed main software code.**

**Module Primary board - A21\_B0L3P**

**Module Secondary board – A48\_A49\_B0R4J**



Mounting options can vary depending on customer requirements.

## Specifications

- **Module Type:** Intrinsically Safe Input/Output Module
- **Supply Input:** 12VDC (+/- 10%) / 20 Watts (Max) (Approved I.S. Supply)
- **Data Communications:** CAN interface over Obelix Fibre
- **Operating Temperature:** -20°C to 70°C
- **Inputs 1:** 32 x I.S. Digital Inputs (12VDC)
- **Inputs 2:** 10 x I.S. Analog Inputs (4-20 mA)
- **Inputs 3:** 4 x I.S. Frequency Counter Inputs (Namur Type, 5 kHz Max)
- **Inputs 4:** 2 x I.S. Resolver Sensor Inputs (industry standard Siemens or Litton)
- **Outputs 1:** 8 x Proportional Solenoid Outputs 0-350mA
- **Outputs 2:** 1 x Proportional Output 0-900mA (Requires 3 links installed in plug A21)
- **Connector 1:** Obelix Fibre
- **Connector 2:** Obelix A21 (12VDS I.S. Supply and Solenoid Outputs)
- **Connector 3:** Obelix A48 (12VDC I.S. Supply Input, Analog Inputs, Counter Inputs and Resolver Sensors)
- **Connector 4:** Obelix A49 (Digital Inputs)

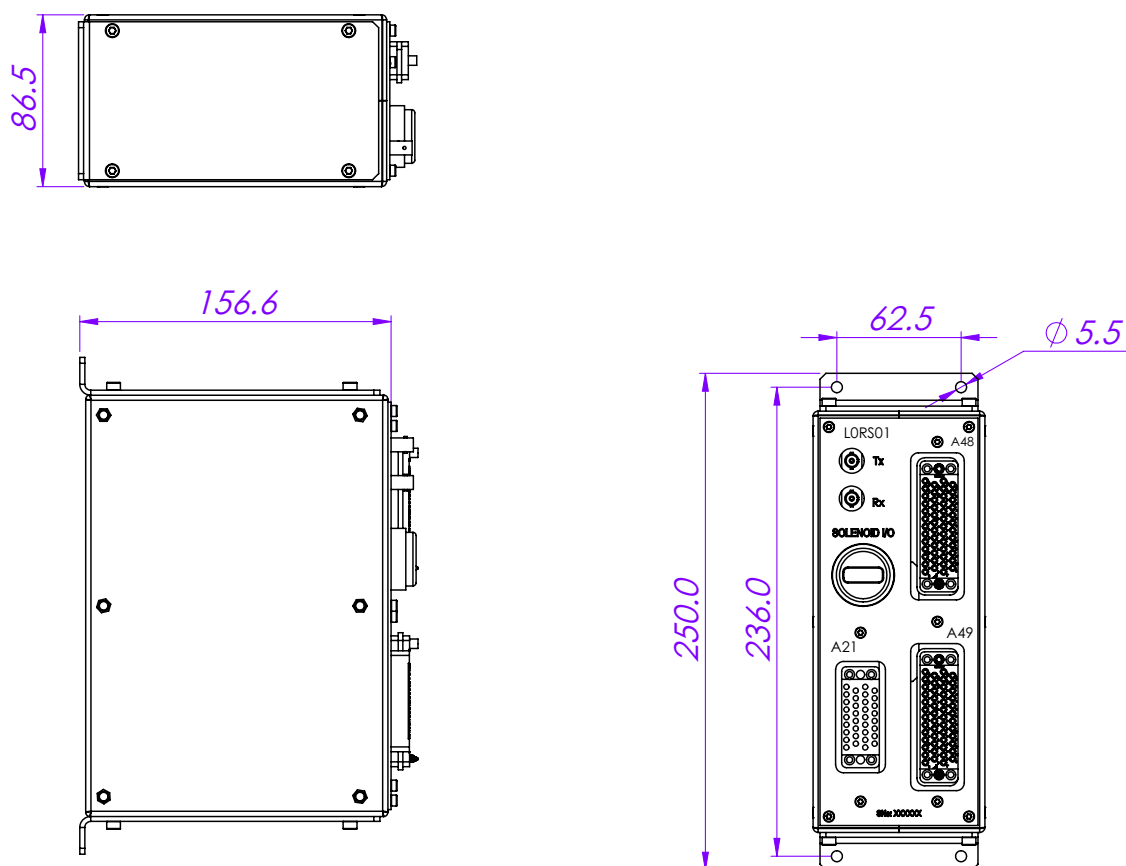
## Heavy Duty Enclosure

- Electroless Nickel Plated
- Rugged Construction

## Mass

- 6.5kg (14.3lb)

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Dimensions (mm)

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### Display Diagnostics

The integral 4 characters LED Matrix display provides the end-user with some basic diagnostics as to the operation of the module. These messages are as follows:

#### Message Explanation Result

##### ON

Omni Flashing Indicates nominal operation and signifies that CAN communications have been established with a host. Normal Operation Permitted

##### CAN

This indicates CAN Communication has not been established or has been lost. Outputs Disabled

##### FEBK

This indicates that internal is NOT congruent with requested outputs. This typically occurs when output has been requested but has failed to operate indicating a supply failure or wiring error. Outputs Disabled

##### SHRT

This indicates that a short-circuit condition has been detected as a requested output. This short-circuit could be external (most probable) or internal Outputs Disabled

##### OPEN

This indicates that the requested output is not drawing sufficient current to operate as expected indicating that the solenoid coil is an open circuit. Outputs Disabled

##### LOAD

This indicates that the requested output is not drawing current as requested when commanded to operate proportionally. Outputs Disable



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### CONNECTOR A21 - Proportional Solenoids 8x 0-350mA variant

Number	Unit / PCB	L0RS0101
	VMCT-34F Female	Name
	Board Mount	
	PIN	
1	A	
2	B	PROP-SOL-1
3	C	
4	D	PROP-SOL-1 Return 0VIS
5	E	
6	F	PROP-SOL-2
7	H	
8	J	PROP-SOL-2 Return 0VIS
9	K	
10	L	PROP-SOL-3
11	M	MODULE SELECT-1
12	N	PROP-SOL-3 Return 0VIS
13	P	
14	R	PROP-SOL-4
15	S	MODULE SELECT-2
16	T	PROP-SOL-4 Return 0VIS
17	U	
18	V	PROP-SOL-5
19	W	MODULE SELECT-3
20	X	PROP-SOL-5 Return 0VIS
21	Y	
22	Z	PROP-SOL-6
23	AA	MODULE SELECT-4
24	BB	PROP-SOL-6 Return 0VIS
25	CC	
26	DD	PROP-SOL-7
27	EE	
28	FF	PROP-SOL-7 Return 0VIS
29	HH	
30	JJ	PROP-SOL- 8
31	KK	
32	LL	PROP-SOL-8 Return 0VIS
33	MM	0VIS Supply
34	NN	12VIS Supply



Image depict coding pins required



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CONNECTOR A21 Proportional Solenoid 0-900mA variant

Number		Unit / PCB VMCT-34F Female Board Mount PIN	L0RS0101  Name
1	A		A-C Link1 in A21 Plug
2	B		PROP-SOL-1
3	C		A-C Link1 in A21 Plug
4	D		PROP-SOL-1 Return 0VIS
5	E		E-H Link2 in A21 Plug
6	F		
7	H		E-H Link2 in A21 Plug
8	J		
9	K		K-P Link3 in A21 Plug
10	L		
11	M		MODULE SELECT-1
12	N		
13	P		K-P Link3 in A21 Plug
14	R		
15	S		MODULE SELECT-2
16	T		
17	U		
18	V		
19	W		MODULE SELECT-3
20	X		
21	Y		
22	Z		
23	AA		MODULE SELECT-4
24	BB		
25	CC		
26	DD		
27	EE		
28	FF		
29	HH		
30	JJ		
31	KK		
32	LL		
33	MM		0VIS Supply
34	NN		12VIS Supply



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### CONNECTOR A48

Number	Unit / PCB GMST50F Female Board Mount PIN	L0RS0101 Name
1	A	INP-COUNTER-1-in
2	B	INP-COUNTER-2-in
3	C	COUNTER-1-supply
4	D	COUNTER-2-supply
5	E	INP-COUNTER-3-in
6	F	INP-COUNTER-4-in
7	H	COUNTER-3-supply
8	J	COUNTER-4-supply
9	K	
10	L	RESOLVER-1-REF+
11	M	
12	N	RESOLVER-1-REF-(0V)
13	P	AN10
14	R	RESOLVER-1-SIN-
15	S	AN9
16	T	AN8
17	U	AN7
18	V	RESOLVER-1-COS+
19	W	AN6
20	X	AN5
21	Y	AN4
22	Z	RESOLVER-1-SIN+
23	a	AN3
24	b	AN2
25	c	AN1
26	d	RESOLVER-1-COS-
27	e	
28	f	
29	h	
30	j	RESOLVER-2-REF+
31	k	
32	m	
33	n	
34	p	RESOLVER-2-REF-(0V)
35	r	
36	s	
37	t	
38	u	RESOLVER-2-SIN-
39	v	
40	w	
41	x	
42	y	RESOLVER-2-COS+
43	z	
44	AA	
45	BB	
46	CC	RESOLVER-2-SIN+
47	DD	12VIS
48	EE	RESOLVER-2-COS-
49	FF	OVIS
50	HH	



Image depict coding pins required

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### CONNECTOR A49

Number	Unit / PCB GMST50F Female Board Mount PIN	L0RS0101 Name
1	A	INP1
2	B	INP2
3	C	INP3
4	D	INP4
5	E	INP5
6	F	INP6
7	H	INP7
8	J	INP8
9	K	INP9
10	L	INP10
11	M	INP11
12	N	INP12
13	P	INP13
14	R	INP14
15	S	INP15
16	T	INP16
17	U	INP17
18	V	INP18
19	W	INP19
20	X	INP20
21	Y	INP21
22	Z	INP22
23	a	INP23
24	b	INP24
25	c	
26	d	
27	e	
28	f	MOD-SEL-3
29	h	
30	j	MOD-SEL-2
31	k	
32	m	MOD-SEL-1
33	n	INP25
34	p	INP26
35	r	INP27
36	s	INP28
37	t	INP29
38	u	INP30
39	v	INP31
40	w	INP32
41	x	
42	y	
43	z	
44	AA	
45	BB	
46	CC	
47	DD	
48	EE	
49	FF	
50	HH	OVIS



Image depict coding pins required



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### Fibre Optic Patch Cables

Part Number	Description
H0LW0401	Fibre Optic Patch ST-ST Multi-Mode
H0M10101	Connector Assembly Fibre 8 way 7m
H0M10201	Connector Assembly Fibre 8 way 10m
H0M10301	Connector Assembly Fibre 8 way 1m
H0M10401	Connector Assembly Fibre 8 way 4m
H0M10801	Connector Assembly Fibre 8 way 8m
H0M10901	Connector Assembly Fibre 8 way 11m
H0M11001	Fibre Optic Patch Assembly 8 way 3m
H0M11201	Connector Assembly Fibre 8 way 12.5m



Image above Fibre Optic Patch ST-ST Multi-Mode

### Specifications

- Product Type:** Pre-manufactured cable assembly
- Construction:** Fibre Optic with ST terminations
- Connector 1 :** Fibre Optic Tx
- Connector 2:** Fibre-optic Rx
- Pin Type:** ST Fibre Plugs
- Conductor Type:** Multi-mode Fibre-optic
- Insulation Rating:** N/A
- Temperature Rating:** -40°C to 85°C

### Connector Assembly

Part Number	Description
H0LZ0101	Connector Assembly A21 (1xProportional)
H0LZ0301	Connector Assembly A21 2.2m (8x Proportional)
H0LZ0501	Connector Assembly A21 2.2m
H0LZ0502	Connector Assembly A21 1.5m
H0LZ0503	Connector Assembly A21 1.5m Fully Populated
H0R40201	Connector Assembly A48 2.2m
H0R40301	Connector Assembly A49 2.2m



### Specifications

- Product Type:** Pre-manufactured cable assembly
- Construction:** Connector with flying leads (pigtail)
- Pin Type:** Male (Gold-plated)
- Conductor Type:** PVDF Tinned Stranded Wire
- Insulation Rating:** 600 volts
- Temperature Rating:** -65 to 105 C
- Recommended Tools:** PVDF / Teflon Insulation Stripping Tool

Cable options can vary depending on customer requirements.