pempek
made for mining

L0MX0101 Obelix Proportional Solenoid Module Ex Ib Intrinsically Safe I/O Namur Inputs Resolvers Type A

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

A unique fibre-optic communications interface means that the module, and dedicated IS power supply, can be conveniently segregated into its, isolated zone.

The fibre-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 typed 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 – A12_A15_B0MDJ

Mounting options can vary depending on customer requirements.

Specifications

- **Module Type:** Intrinsically Safe Input / Output with Display
- **Supply:** 12VDC (+/- 10%) / 20 Watts (Max) from Approved I.S. Power Supply
- **Data Communications:** CAN interface over Obelix Fibre
- **Operating Temperature:** -20$^{\circ C}$ to +85$^{\circ C}$ all industrial components
- **Inputs 1:** 8 x I.S. Digital Inputs (12VDC)
- **Inputs 2:** 4 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)
- **Inputs 5:** 28 x Proximity Switch Inputs (Namur Type)
- **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:** CAN Interface over Obelix Fibre
- **Connector 2:** Obelix A21 (12VDS I.S Supply and Solenoid Outputs)
- **Connector 3:** Obelix A12 (Digital Inputs, Analog Inputs, Frequency Counter Inputs, Resolver Sensors and Proximity Switch Inputs)
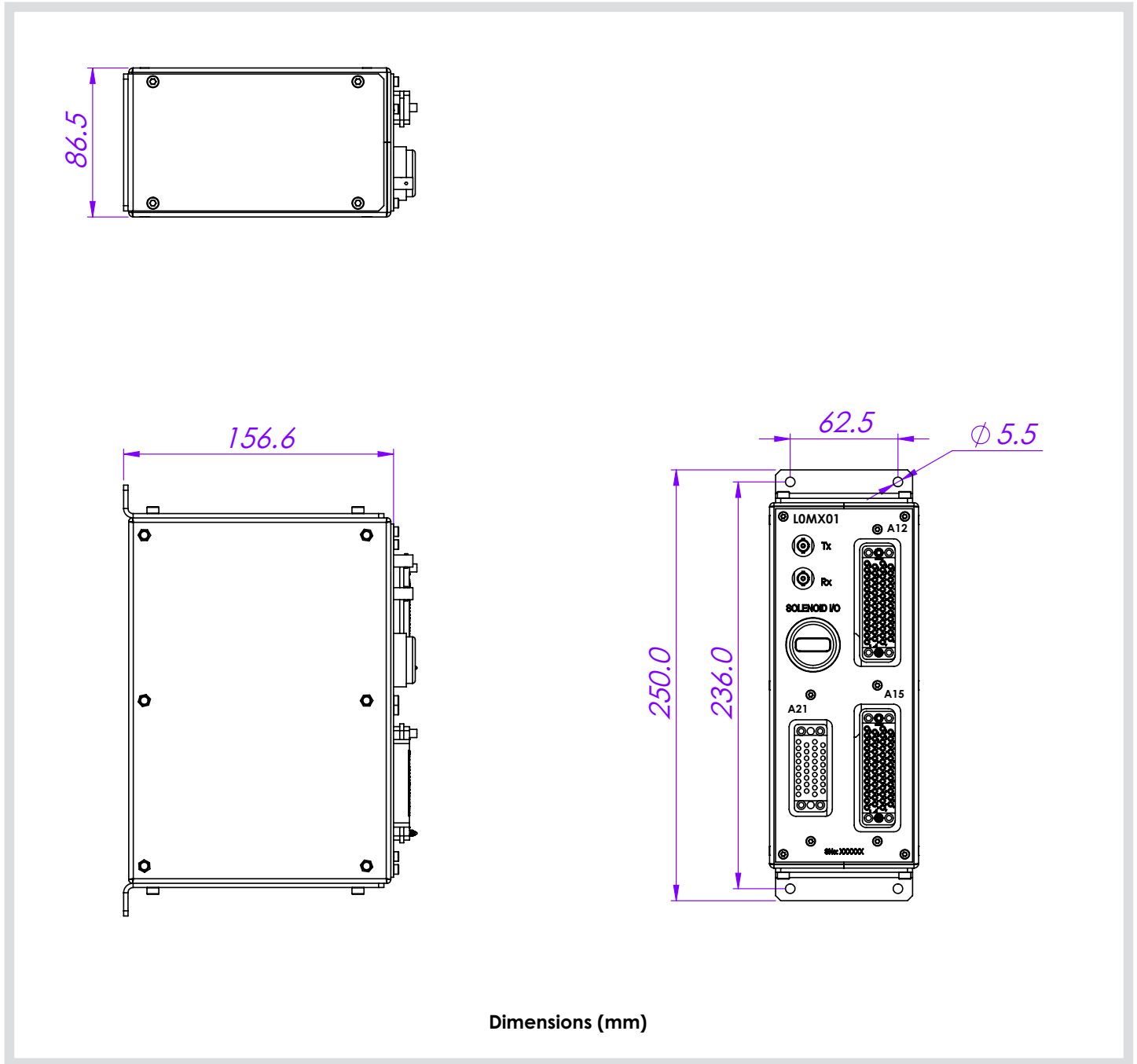- **Connector 4:** Obelix A15 (12VDC I.S. Supply and Proximity Switch Inputs)

Heavy Duty Enclosure
- Electroless Nickel Plated
- Rugged Construction

Mass
- 6.5kg (14.3lb)

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Dimensions (mm)

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 Solenoid 0-900mA variant

Number	Unit / PCB VMCT-34F Female Board Mount PIN	L0MX0101 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

Image depict coding pins required

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

Number	Unit / PCB VMCT-34F Female Board Mount PIN	L0MX0101 Name
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

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CONNECTOR A12

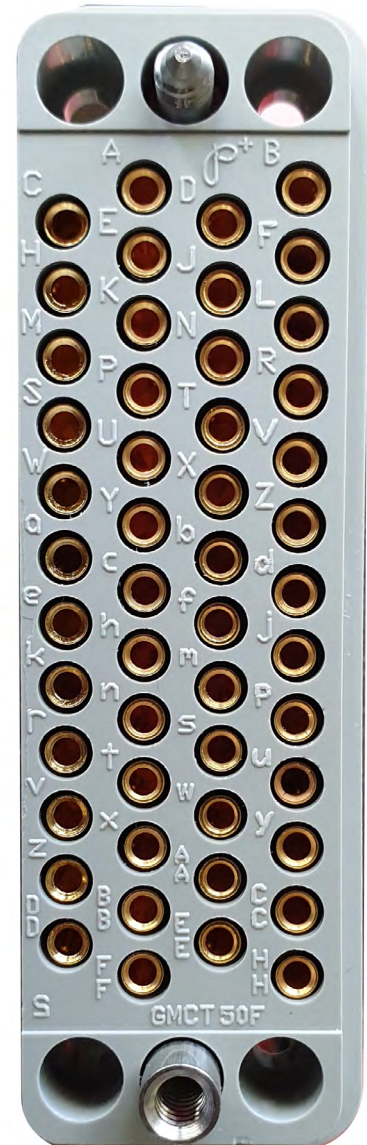| Number	Unit / PCB GMST50F Female Board Mount PIN	L0MX0101 Name
1	A	INPUT-COUNTER-1
2	B	INPUT-COUNTER-2
3	C	INPUT-COUNTER-3
4	D	INPUT-COUNTER-4
5	E	SUPPLY PROXIMITY SWITCH-25
6	F	RESOLVER-1(REF-2)
7	H	PROXIMITY SWITCH-25
8	J	SUPPLY PROXIMITY SWITCH-26
9	K	PROXIMITY SWITCH-26
10	L	RESOLVER-1(REF-1)
11	M	SUPPLY PROXIMITY SWITCH-27
12	N	PROXIMITY SWITCH-27
13	P	SUPPLY PROXIMITY SWITCH-28
14	R	RESOLVER-1(GND-COS)
15	S	PROXIMITY SWITCH-28
16	T	
17	U	
18	V	RESOLVER-1(COS)
19	W	
20	X	
21	Y	ANALOG-4
22	Z	RESOLVER-1(SIN)
23	a	ANALOG-3
24	b	ANALOG-2
25	c	ANALOG-1
26	d	RESOLVER-1(GND-SIN)
27	e	MODULE SELECT-4
28	f	MODULE SELECT-3
29	h	MODULE SELECT-2
30	j	RESOLVER-2(REF-2)
31	k	MODULE SELECT-1
32	m	INP-8
33	n	INP-7
34	p	RESOLVER-2(REF-1)
35	r	
36	s	INP-6
37	t	INP-5
38	u	RESOLVER-2(GND-COS)
39	v	
40	w	INP-4
41	x	INP-3
42	y	RESOLVER-2(COS)
43	z	
44	AA	INP-2
45	BB	INP-1
46	CC	RESOLVER-2(SIN)
47	DD	
48	EE	RESOLVER-2(GND-SIN)
49	FF	0VIS
50	HH	

Image depict coding pins required

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CONNECTOR A15

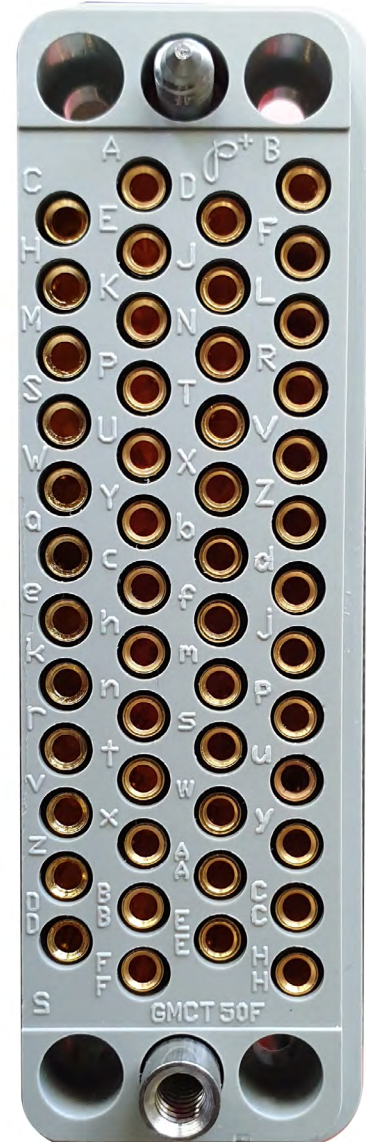| Number	Unit / PCB GMST50F Female Board Mount PIN	L0MX0101 Name
1	A	SUPPLY PROXIMITY SWITCH-1
2	B	PROXIMITY SWITCH-1
3	C	SUPPLY PROXIMITY SWITCH-2
4	D	PROXIMITY SWITCH-2
5	E	SUPPLY PROXIMITY SWITCH-3
6	F	PROXIMITY SWITCH-3
7	H	SUPPLY PROXIMITY SWITCH-17
8	J	PROXIMITY SWITCH-17
9	K	SUPPLY PROXIMITY SWITCH-4
10	L	PROXIMITY SWITCH-4
11	M	SUPPLY PROXIMITY SWITCH-18
12	N	PROXIMITY SWITCH-18
13	P	SUPPLY PROXIMITY SWITCH-5
14	R	PROXIMITY SWITCH-5
15	S	SUPPLY PROXIMITY SWITCH-19
16	T	PROXIMITY SWITCH-19
17	U	SUPPLY PROXIMITY SWITCH-6
18	V	PROXIMITY SWITCH-6
19	W	SUPPLY PROXIMITY SWITCH-7
20	X	PROXIMITY SWITCH-7
21	Y	SUPPLY PROXIMITY SWITCH-8
22	Z	PROXIMITY SWITCH-8
23	a	SUPPLY PROXIMITY SWITCH-20
24	b	PROXIMITY SWITCH-20
25	c	SUPPLY PROXIMITY SWITCH-9
26	d	PROXIMITY SWITCH-9
27	e	SUPPLY PROXIMITY SWITCH-21
28	f	PROXIMITY SWITCH-21
29	h	SUPPLY PROXIMITY SWITCH-10
30	j	PROXIMITY SWITCH-10
31	k	SUPPLY PROXIMITY SWITCH-22
32	m	PROXIMITY SWITCH-22
33	n	SUPPLY PROXIMITY SWITCH-11
34	p	PROXIMITY SWITCH-11
35	r	SUPPLY PROXIMITY SWITCH-12
36	s	PROXIMITY SWITCH-12
37	t	SUPPLY PROXIMITY SWITCH-13
38	u	PROXIMITY SWITCH-13
39	v	SUPPLY PROXIMITY SWITCH-23
40	w	PROXIMITY SWITCH-23
41	x	SUPPLY PROXIMITY SWITCH-14
42	y	PROXIMITY SWITCH-14
43	z	SUPPLY PROXIMITY SWITCH-24
44	AA	PROXIMITY SWITCH-24
45	BB	SUPPLY PROXIMITY SWITCH-15
46	CC	PROXIMITY SWITCH-15
47	DD	SUPPLY PROXIMITY SWITCH-16
48	EE	PROXIMITY SWITCH-16
49	FF	0VIS Supply
50	HH	12VIS Supply

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:** $-40^{\circ C}$ to $85^{\circ C}$

Connector Assembly

Part Number	Description
H0MD0101	Connector Assembly A12
H0MD0201	Connector Assembly A15
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

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.