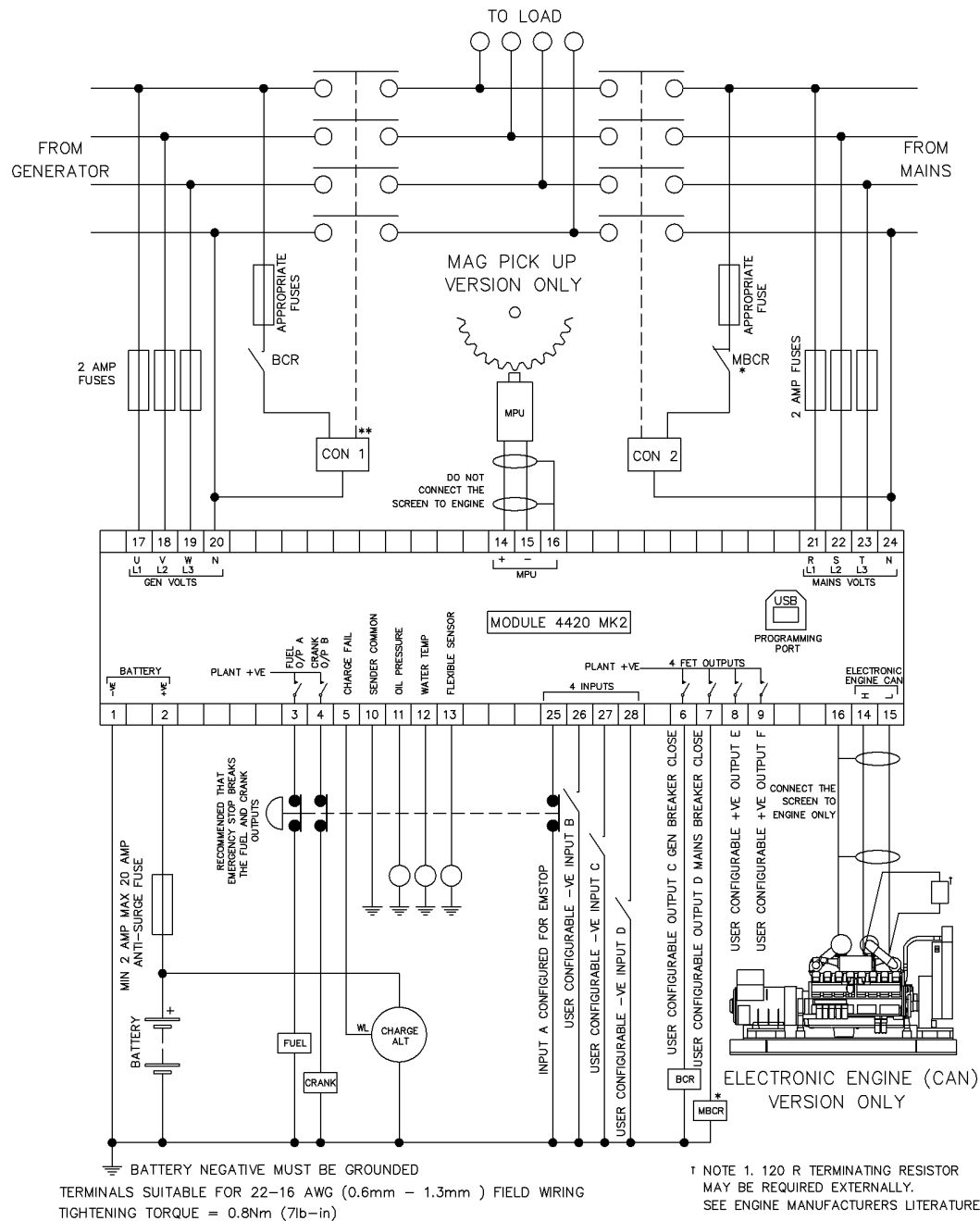


OUTPUT SOURCE LIST	
0	Not used
1	Air flap relay (1)
2	Arm safety on alarms
3	Audible alarm
4	Battery over volts warning
5	Battery under volts warning
6	Can ECU data fail
7	Can ECU error
8	Can ECU fail
9	Can ECU power
10	Can ECU stop
11	Charge alternator shutdown
12	Charge alternator warning
13	Close gen output
14	Close gen output pulse
15	Close mains output
16	Close mains output pulse
17	Combined mains failure
18	Common alarm
19	Common electrical trip
20	Common shutdown
21	Common warning
22	Cooling down
23	Digital input A
24	Digital input B
25	Digital input C
26	Digital input D
27	Digital input E
28	Digital input F
29	Emergency stop
30	Energise to stop
31	Fail to come to rest
32	Fail to start
33	Fuel relay
34	Gas choke on
35	Gas ignition
36	Generator available
37	Generator over voltage shutdown
38	RESERVED
39	RESERVED
40	Loss of magnetic pickup signal
41	Low fuel level
42	Low oil pressure (shutdown)
43	Mains high frequency
44	Mains high voltage
45	Mains low frequency
46	Mains low voltage
47	Open gen output
48	Open gen output pulse
49	Open mains output
50	Open mains output pulse
51	Over frequency shutdown
52	Over speed shutdown
53	Preheat during preheat timer
54	Preheat until end of crank
55	Preheat until end of safety timer
56	Preheat until end of warming timer
57	Smoke limiting
58	Start relay
59	Under frequency shutdown
60	Under speed shutdown
61	Waiting for manual restore

TYPICAL WIRING DIAGRAM



BATTERY NEGATIVE MUST BE GROUND
 TERMINALS SUITABLE FOR 22-16 AWG (0.6mm - 1.3mm) FIELD WIRING
 TIGHTENING TORQUE = 0.8Nm (7lb-in)

**NOTE 3. IT IS RECOMMENDED THAT THE GENERATOR AND MAINS SWITCHING DEVICES ARE MECHANICALLY AND ELECTRICALLY INTERLOCKED.

† NOTE 1. 120 Ω TERMINATING RESISTOR MAY BE REQUIRED EXTERNALLY. SEE ENGINE MANUFACTURERS LITERATURE

* NOTE 2. MAINS BREAKER CLOSED OUTPUT SHOULD BE CONFIGURED FOR DE-ENERGISE CLOSE MAINS, AND USE THE NORMALLY CLOSED CONTACTS OF MBCR



4420 INSTALLATION INSTRUCTIONS

This instruction sheet is for 4420 Mk2 controllers only.

ACCESSING THE FRONT PANEL CONFIGURATION EDITOR

Ensure the engine is at rest and the module is in stop mode by pressing the stop/reset button. Press the stop/reset and down buttons simultaneously. The configuration icon is displayed, along with the first configurable parameter.

EDITING A PARAMETER

Press to select the required 'page' as detailed in the configuration tables.

Press (+) to select the next parameter or (-) to select the previous parameter within the current page.

When viewing the parameter to be changed, press the button. The value begins to flash.

Press (+) or (-) to adjust the value to the required setting.

Press the save the current value, the value ceases flashing.

Press and hold the button to exit the editor, the configuration icon will be removed from the display.

NOTE: - pressing and holding the + / - buttons will give auto-repeat functionality. Large values can be changed quicker by holding the buttons for a prolonged period. For instance large timers increment in 1 second steps to 1 minute, then in 30 second steps to 1 hour, then in 30 minute steps.

DIMENSIONS

180mm x 116mm x 42mm (7.1" x 4.6" x 1.7")

PANEL CUTOUT

154mm x 98mm (6" x 3.9")

<p>CENTRO DE DISTRIBUCIÓN EDIFICIO PRINCIPAL Y CALL CENTER Dirección: Cdla. Guayaquil Mz. 4 Solar N°16 (Frente al Mall del Sol) Teléfono: 094044873 593-94044873 E-mail: rlapo@inmaelectro.com</p>	<p>GUAYAQUIL (SUCURSAL PRINCIPAL) Dirección: Av. Juan Tanca Marengo Km. 2 1/2 C.C. Sepropisa Local 5-6 Teléfono: 593-4-2-278048 - 593-4-2-277225 Fax: 593-4-2-641355 E-mail: rlapo@inmaelectro.com inmaelectro@hotmail.com</p>
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CONFIGURATION PARAMETERS – MODULE (PAGE 1)					
101	Contrast	000 (%)	106	Protected start enable	On (1), off (0)
102	Fast loading enabled	On (1), off (0)	107	RESERVED	
103	RESERVED		108	Event log display format	On (1), off (0)
104	Lamp test at startup	On (1), off (0)	109	Start in auto	On (1), off (0)
105	Power save mode enable	On (1), off (0)	110	Diagnostic Trouble Code string (english only) enable	On (1), off (0) ^{CAN}

CONFIGURATION PARAMETERS – APPLICATION (PAGE 2) (CAN VERSION MODULE ONLY)					
201	Alternate engine speed	On (1), off (0)	203	Can ECU data fail action	0 (action)
202	Can ECU data fail enable	On (1), off (0)	204	Can ECU data fail delay	0:00

CONFIGURATION PARAMETERS – INPUTS (PAGE 3)					
301	Low oil pressure enable			On (1), off (0)	
302	Low oil pressure trip			0.00 bar	
303	High engine temperature trip			00 deg c	
304	Digital input A source			0 (input source)	
305	Digital input A polarity			0 (polarity)	
306	Digital input A action (if source = user config)			0 (action)	
307	Digital input A arming (if source = user config)			0 (arming)	
308	Digital input A activation delay (if source = user config)			0:00	
309	Digital input B source			0 (input source)	
310	Digital input B polarity			0 (polarity)	
311	Digital input B action (if source = user config)			0 (action)	
312	Digital input B arming (if source = user config)			0 (arming)	
313	Digital input B activation delay (if source = user config)			0:00	
314	Digital input C source			0 (input source)	
315	Digital input C polarity			0 (polarity)	
316	Digital input C action (if source = user config)			0 (action)	
317	Digital input C arming (if source = user config)			0 (arming)	
318	Digital input C activation delay (if source = user config)			0:00	
319	Digital input D source			0 (input source)	
320	Digital input D polarity			0 (polarity)	
321	Digital input D action (if source = user config)			0 (action)	
322	Digital input D arming (if source = user config)			0 (arming)	
323	Digital input D activation delay (if source = user config)			0:00	
324	Analogue input A sensor type			0 (sensor type)	
325	Analogue input A sensor selection (pressure sensor list)			0 (pressure sensor)	
326	Analogue input A (set as digital) source (oil pressure sender)			0 (input source)	
327	Analogue input A (set as digital) polarity			0 (polarity)	
328	Analogue input A (set as digital) action (if source = user config)			0 (action)	
329	Analogue input A (set as digital) arming (if source = user config)			0 (arming)	
330	Analogue input A (set as digital) activation delay (if source = user config)			0:00	
331	Analogue input B sensor type			0 (sensor type)	
332	Analogue input B sensor selection (temperature sensor list)			0 (temp sensor)	
333	Analogue input B (set as digital) source (temperature sender)			0 (input source)	
334	Analogue input B polarity (set as digital)			0 (polarity)	
335	Analogue input B (set as digital) action (if source = user config)			0 (action)	
336	Analogue input B (set as digital) arming (if source = user config)			0 (arming)	
337	Analogue input B (set as digital) activation delay (if source = user config)			0:00	
338	Analogue input C sensor type			0 (sensor type)	
339	Analogue input C sensor selection (pressure / temp / percentage)			0 (sensor)	
340	Analogue input C (set as digital) source (flexible sender)			0 (input source)	
341	Analogue input C (set as digital) polarity			0 (polarity)	
342	Analogue input C (set as digital) action (if source = user config)			0 (action)	
343	Analogue input C (set as digital) arming (if source = user config)			0 (arming)	
344	Analogue input C (set as digital) activation delay (if source = user config)			0:00	
345	Oil pressure sender open circuit alarm			On (1), off (0)	
346	Temperature sender open circuit alarm			On (1), off (0)	

CONFIGURATION PARAMETERS – OUTPUTS (PAGE 4)					
401	Digital output A source			0 (output source)	
402	Digital output A polarity			0 (output source polarity)	
403	Digital output B source			0 (output source)	
404	Digital output B polarity			0 (output source polarity)	
405	Digital output C source			0 (output source)	
406	Digital output C polarity			0 (output source polarity)	
407	Digital output D source			0 (output source)	
408	Digital output D polarity			0 (output source polarity)	
409	Digital output E source			0 (output source)	
410	Digital output E polarity			0 (output source polarity)	
411	Digital output F source			0 (output source)	
412	Digital output F polarity			0 (output source polarity)	

CONFIGURATION PARAMETERS – TIMERS (PAGE 5)					
501	Mains transient delay	507	Smoke limiting off	513	Failed to stop delay
502	Start delay	508	Safety on delay	514	Generator transient delay
503	Preheat timer	509	Warm up time	515	Power save mode delay
504	Crank time	510	Return delay	516	Transfer time
505	Crank rest time	511	Cooling time	517	Breaker trip pulse
506	Smoke limiting	512	Ets solenoid hold	518	Breaker close pulse

CONFIGURATION PARAMETERS – GENERATOR (PAGE 6)					
601	Alternator fitted			On (1), off (0)	
602	Alternator poles			0	
603	Reserved				
604	Reserved				
605	Under voltage enabled			On (1), off (0)	
606	Under voltage level			0 V	
607	Loading voltage			0 V	
608	Over voltage level			0 V	
609	Under frequency enable			On (1), off (0)	
610	Under frequency level			0.0 Hz	
611	Loading frequency			0.0 Hz	
612	Nominal frequency			0.0 Hz	
613	Over frequency enable			On (1), off (0)	
614	Over frequency trip			0.0 Hz	
615	AC system			AC system (see table below)	

CONFIGURATION PARAMETERS – MAINS (PAGE 7)					
701	AC system			AC system (see table)	
702	Mains failure detection			On (1), off (0)	
703	Immediate mains dropout			On (1), off (0)	
704	Under voltage enable			On (1), off (0)	
705	Under voltage level			0 V	
706	Under voltage return			0 V	
707	Over voltage enable			On (1), off (0)	
708	Over voltage return			0 V	
709	Over voltage level			0 V	
710	Under frequency enable			On (1), off (0)	
711	Under frequency level			0.0 Hz	
712	Under frequency return			0.0 Hz	
713	Over frequency enable			On (1), off (0)	
714	Over frequency return			0 Hz	
715	Over frequency level			0.0 Hz	

CONFIGURATION PARAMETERS – ENGINE (Page 8)					
801	Magnetic pickup fitted			On (1), off (0)	
802	Flywheel teeth			000	
803	Start Attempts			0	
804	RESERVED				
805	RESERVED				
806	Gas choke timer (Gas engine only)			0:00	
807	Gas on delay (Gas engine only)			0:00	
808	Gas ignition off delay (Gas engine only)			0:00	
809	Crank disconnect on Oil pressure enable			On (1), off (0)	
810	Check oil pressure prior to starting			On (1), off (0)	
811	Crank disconnect on Oil threshold			0.00 Bar	
812	Crank disconnect on frequency			0.0Hz	
813	Crank disconnect on Engine Speed			000 rpm	
814	Under speed enable			On (1), off (0)	
815	Under speed trip			0000 rpm	
816	Over speed trip			0000 rpm	
817	Low battery volts enable			On (1), off (0)	
818	Low battery volts trip			00.0 V	
819	Low battery volts return			00.0 V	
820	Low battery volts delay			0:00:00	
821	High battery volts enable			On (1), off (0)	
822	High battery volts return			00.0 V	
823	High battery volts warning			00.0 V	
824	High battery volts warning delay			00.0 V	
825	Charge alt shutdown enable			On (1), off (0)	
826	Charge alt shutdown trip			00.0 V	
827	Charge alt shutdown trip delay			0:00:00	
828	Charge alt warning trip enable			On (1), off (0)	
829	Charge alt warning trip			00.0 V	
830	Charge alt warning trip delay			0:00:00	
831	Low battery start Arming			On (1), off (0)	
832	Low battery start Threshold			00.0 V	
833	Low battery start Delay			0:00:00	
834	Low battery start Run time			0:00:00	

CONFIGURATION PARAMETERS – ALTERNATIVE CONFIGURATION (PAGE 9)					
901	Alt config – Default configuration			Main(1), alternative(0)	
902	Alt config – Enable configuration			On (1), off (0)	
903	Alt config - Alternative engine speed			On (1), off (0)	
904	Alt config - Under voltage shutdown enable			On (1), off (0)	
905	Alt config - Under voltage trip			On (1), off (0)	
906	Alt config - Loading voltage			0 v	
907	Alt config - Over voltage trip level			0 v	
908	Alt config - Under frequency enabled			On (1), off (0)	
909	Alt config - Under frequency trip level			0.0 hz	
910	Alt config - Loading frequency			0.0 hz	
911	Alt config - Nominal frequency			0.0 hz	
912	Alt config - Over frequency enabled			On (1), off (0)	
913	Alt config - Over frequency trip level			0.0 hz	
914	Alt config - AC system			0 (AC system)	
915	Alt config - Mains failure detection			On (1), off (0)	
916	Alt config - Immediate mains dropout			On (1), off (0)	
917	Alt config - Mains under volt enable			On (1), off (0)	
918	Alt config - Mains under volt trip			0 V	
919	Alt config - Mains under volt return			0 V	
920	Alt config - Mains over volt enable			On (1), off (0)	
921	Alt config - Mains over volt return			0 V	
922	Alt config - Mains over volt trip			0 V	
923	Alt config - Mains under frequency enable			On (1), off (0)	
924	Alt config - Mains under frequency trip			0.0 Hz	
925	Alt config - Mains under frequency return			0.0 Hz	
926	Alt config - Mains over frequency enable			On (1), off (0)	
927	Alt config - Mains over frequency return			0.0 Hz	
928	Alt config - Mains over frequency trip			0.0 Hz	
929	Alt config – Alternative under speed shutdown enable			On (1), off (0)	
930	Alt config – Alternative under speed shutdown trip			0000 RPM	
931	Alt config – Alternative over speed shutdown trip			0000 RPM	

Output source list overleaf...

CONFIGURATION PARAMETERS – FLEXIBLE SENSOR (PAGE 10)					
1001	Flexible sensor alarm arming				0 (Arming)
1002	Flexible sensor - Low alarm enable				0 (Action)
1003	Flexible sensor - Low alarm trip (units depend upon sensor type)				0 % / 0.00 bar / 0 °C
1004	Flexible sensor - High alarm enable				0 (Action)
1005	Flexible sensor - High alarm trip (units depend upon sensor type)				0 % / 0.00 bar / 0 °C
1006	Flexible sensor - Low warning enable				On (1), Off (0)
1007	Flexible sensor - Low warning trip (units depend upon sensor type)				0 % / 0.00 bar / 0 °C
1008	Flexible sensor – High warning enable				On (1), Off (0)
1009	Flexible sensor – High warning trip (units depend upon sensor type)				0 % / 0.00 bar / 0 °C

CONFIGURATION PARAMETERS – SCHEDULER (Page 11)					
1101	Enable scheduler			On (1), off (0)	
1102	On or off load			On (1), off (0)	
1103	Start time			0:00:00	
1104	Day				0 (Day, 1=Monday)
1105	Duration				0:00:00

CONFIGURATION PARAMETERS – TIME AND DAY (Page 12)					
1201	Time of day			0:00	
1202	Day of week				0 (Day, 1=Monday)

Parameters with multiple choices use the following identification tables for the parameter values :

INPUT SOURCE LIST			
0	User Configured	8	Emergency Stop
1	Alarm Mute	9	External Panel Lock
2	Alarm Reset	10	RESERVED
3	Alternative Configuration	11	Generator load inhibit
4	Auto restor inhibit	12	Lamp Test
5	Auto start inhibit	13	Low Fuel Level Switch
6	Auxiliary mains fail	14	RESERVED
7	Coolant Temperature Switch	15	Mains load inhibit
16	Oil Pressure Switch		
17	Remote Start Off Load		
18	Remote Start On Load		
19	Simulate mains available		
20	Smoke Limiting		
21	Close Gen / Open Mains		
22	Open Gen / Close Mains		

INPUT ACTION LIST	
Index	Action
0	Electrical Trip
1	Shutdown
2	Warning

INPUT ARMING LIST	
Index	Arming
0	Always
1	From Safety On
2	From Starting
3	Never

INPUT POLARITY LIST	
Index	Action
0	Close to Activate
1	Open to Activate

OUTPUT POLARITY LIST	
Index	Arming
0	Energise
1	De-energise

CAN DATA FAIL ACTION	
Index	Action
0	None
1	Shutdown
2	Warning always latched

CAN DATA FAIL ARMING	
Index	Arming
0	From Safety On
1	From Starting

FLEXIBLE SENSOR ALARM ACTION LIST	
Index	Action
0	None
1	Shutdown
2	Electrical Trip

AC SYSTEM	
Index	Type
0	2 phase 3 wire (L1-L2)
1	2 phase 3 wire (L1-L3)
2	3 phase 3 wire
3	3 phase 4 wire
4	3 phase 4 wire (Delta)
5	Single phase 2 wire

FLEXIBLE SENSOR TYPE	
Index	Type
0	None
1	Digital Input
2	Percentage sensor
3	Pressure sensor
4	Temperature sensor

SENSOR SELECTIONS FOR PERCENTAGE	
0	Not used
1	Dig closed for alarm
2	Dig open for alarm
3	VDO ohm (10-180)
4	VDO tube (90-0)
5	Us ohm (240-33)
6	GM ohm (0-90)
7	GM ohm (0-30)
8	Ford (73-10)
9	User defined

SENSOR SELECTIONS FOR OIL PRESSURE	
0	Not used
1	Dig closed for alarm
2	Dig open for alarm
3	VDO 5 bar
4	VDO 10 bar
5	Datacon 5 bar
6	Datacon 10 bar
7	Datacon 7 bar
8	Murphy 7 bar
9	CMB812
10	Veglia
11	User defined

SENSOR SELECTIONS FOR COOLANT TEMPERATURE	
0	Not used
1	Dig closed for alarm
2	Dig open for alarm
3	VDO 120 °C
4	Datacon