# 6. EXPANSION OUTPUT MODULE OPTION

Optional expansion output modules are available for the MEC 2 engine generator controller. Each module can provide 16 individual fault output contacts for remote alarming or control purposes. The expansion modules are interconnected to the MEC 2 controller via RS422 communication link utilizing 8 conductor shielded cable with plug-in RJ45 connectors. Refer to FIGURE #13 for the expansion output module connection diagram.

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#### **MEC 2 MICROPROCESSOR ENGINE/GENERATOR CONTROLLER**

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				TO ADDITION	NAL		
		тс	) MEC 2 J6	EXPANSI	ON		
12-24VDC	Б+ — 1А о о	B+	J1			RELAY ID	C282/NFPA STANDARD FAULTS (J17 OFF)
POWER		Ĭ	RJ45 IN	RJ45 OU	т	1	EMERGENCY STOP
INPUT	в-	В-				2	OVERCRANK
	( '					3	OVERSPEED
						4	LOSS OF SPEED SIGNAL
	S GRD					5	WEAK BATTERY
			_	_		6	LOW BATTERY VOLTAGE
		Γ κ		$\overline{\mathbf{v}}$		7	HIGH BATTERY VOLTAGE
			0	0		8	LOW ENGINE TEMPERATURE
		3			<u>19</u>	9	HIGH ENGINE TEMPERATURE ALARM
				3 O	к10 20	10	LOW OIL PRESSURE ALARM
			0			11	DIGITAL FAULT #1
		5			21	12	DIGITAL FAULT #2
			$3 0 \sqrt{3}$	3 O		13	DIGITAL FAULT #3
		le ∓"			К112	14	DIGITAL FAULT #4
		Ĭ				15	SWITCH NOT IN AUTO
				$\sqrt[3]{0}$	23	16	PROGRAMMABLE OUTPUT #5
				√3/ 0 0 0	к12 <u>24</u>		ADDITIONAL FAULTS (J17 ON)
		9			25	1	UNDER VOLTAGE
		ĬЦк		3 0 0	к13 🗕 🕺	2	OVER VOLTAGE
			0	0	-26	3	UNDER FREQUENCY
		11			27	4	OVER FREQUENCY
				3 0 0 0	к14 🗕 🗍	5	OVER FREquenci
		<u>12</u>	0	0		6	HIGH ENGINE TEMP 2 SHUTDOWN
		13			29	7	LOW OIL PRESSURE 2 SHUTDOWN
				$\sqrt[3]{0}$		8	
		<u> 14</u> "	0		К15 30	9	
		15			24	10	
				$\sqrt{3}$	31	11	
		$\int_{16} = \frac{\kappa}{\sqrt{3}}$			$K_{16}$ $32$	12	
		Ĭ	/ Ľ	2	~ <u> </u>	13	
						14	
		2 0	O J17			15	
						16	PROGRAMMABLE OUTPUT #6
							TROOMANIMABLE OUT OF #0
	NOTES:					-	

ALL CONTACTS RATED MAXIMUM 0.5A, 120VAC/1.0A, 30Vdc RESISTIVE

2 PROGRAMMABLE MODULE ADDRESS (REMOVE JUMPER FOR STANDARD C282/NFPA FAULTS, ADD JUMPER FOR ADDITIONAL FAULTS)

- ACTIVATED)
- 4 PROGRAMMABLE CONTACT USER CONFIGURED FUNCTION VIA MEC 2 SOFTWARE (REFER TO MEC 2 LITERATURE)
- <sup>5</sup> "GRD" CONNECTION TO BE MADE TO COMMON CHASSIS/ENCLOSURE GROUND BOND SYSTEM
- C282 OR NFPA 110 STANDARD FAULTS <u>EXCLUDE</u> ANALOG FAULTS OVER/UNDER VOLTAGE, OVER/UNDER FREQUENCY, OVER CURRENT, AND PROGRAMMABLE OUTPUT #6 (I.E. MUST SPECIFY SECOND EXPANSION MODULE TO OBTAIN CONTACTS FOR THESE FAULTS).

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#### FIGURE #13: EXPANSION OUTPUT MODULE CONNECTION DIAGRAM

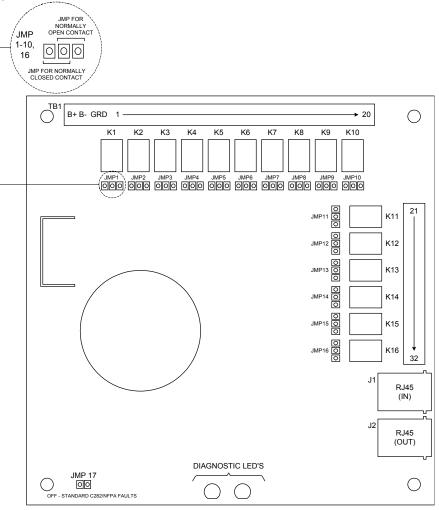
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### MEC 2 MICROPROCESSOR ENGINE/GENERATOR CONTROLLER

The expansion module outputs are relay contacts that may be individually configured for normally open or normally closed contact position. Contact configuration is via circuit board mounted jumper pins and clips. Refer to FIGURE #18 for jumper pin location and configuration settings. Each output contact is rated maximum 0.5A 120VAC, 1.0A 30Vdc resistive.

Each expansion module also provides one programmable contact for desired control function. Refer to <u>Section 9.2</u> of this manual for programming functions and procedures for the programmable contact feature.

Note: The communication cable between the MEC 2 and the expansion module must be ordered separately.



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## FIGURE #14: MEC 2 EXPANSION OUTPUT MODULE PRINTED CIRCUIT BOARD LAYOUT

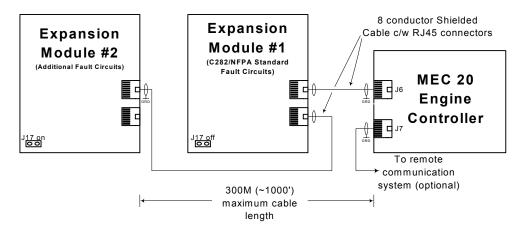
### MEC 2 MICROPROCESSOR ENGINE/GENERATOR CONTROLLER

Diagnostic LED's are provided on each expansion module as shown in FIGURE #13. Their functions are described as follows:

WATCHDOG - This LED flashes on and off at a very high rate which indicates that the expansion module microprocessor is functioning normally.

MESSAGE - This LED flashes on and off at irregular intervals which indicates that the expansion module is correctly receiving all data messages from the MEC 2.

Two expansion modules may be connected to a single MEC 2 controller to provide additional output contacts. Two modules are interconnected together using a single communication cable to the MEC 2 controller. Refer to FIGURE #15 for interconnection details. The first expansion module addresses standard C282/NFPA110 MEC 2 fault circuits<sup>1</sup> and the second expansion module addresses all additional fault circuits. To select which faults are addressed by each expansion module, jumper pins and clips are provided on the circuit boards. Refer to FIGURE #16 for jumper pin location and configuration settings.



<sup>1</sup> C282 or NFPA 110 standard faults <u>exclude</u> analog faults Over/Under voltage, Over/Under Frequency, Overcurrent, spare digital inputs #5-#12 and programmable output #6 (i.e. must specify second expansion module to obtain contacts for these faults).

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### FIGURE #15 MEC 2 EXPANSION MODULE INTERCONNECTION DIAGRAM