



**HORNER
ELECTRIC
ADVANCED
PRODUCTS
GROUP**

Horner Electric's Operator Interface Unit for GE Fanuc GENIUS™ and Universal Automation FloPro™

User's Manual, for *HE693OIU190*

Horner Electric Advanced Products Group

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12-10-97

MAN0062-01

FOR NORTH AMERICA ONLY!

MODEL NUMBER: HE693OIU190

SERIAL NUMBER: _____

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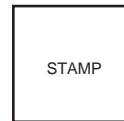
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PREFACE

This manual explains how to use the Horner Electric Operator Interface Unit for use with the GE Fanuc Genius I/O Network and Universal Automation's FloPro.

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**PUBLICATION NUMBER:
HFK-60-190-A-A**

First Edition, April 1994

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ABOUT THE PROGRAM EXAMPLES

Any example programs and program segments in this manual are included solely for illustrative purposes. Due to the many variables and requirements associated with any particular installation, Horner Electric cannot assume responsibility or liability for actual use based on the examples and diagrams. It is the sole responsibility of the system designer utilizing this software to appropriately design the end system, to appropriately integrate the Operator Interface Unit and to make safety provisions for the end equipment as is usual and customary in industrial applications as defined in any codes or standards which apply.

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CHAPTER 1: INTRODUCTION

Congratulations on your purchase of the Horner Electric Operator Interface Unit! This unit has been designed using state-of-the-art electronic components and incorporates a sophisticated firmware package that gives the Original Equipment Manufacturer (OEM) the ability to utilize this unit with the powerful FloPro Development Package from Universal Automation.

1.1 What You Have

The Horner Electric Operator Interface Unit (OIU) comes complete with the following items:

- A. Assembled OIU module and mounting hardware, including the Micro-Genius™ Network Interface board (uGENI).
- B. Steel Rear Cover for OIU.
- C. This manual.

1.2 Operator Interface Unit Features

The Horner Operator Interface Unit provides the following features:

- A. Gasketed NEMA 4-12 panel with a rugged Lexan™ overlay, mounting hardware included.
- B. Four line by 20 character dot-matrix vacuum-fluorescent display.
- C. Tactile feel keypad with numeric support plus special function keys.
- D. Integrated Genius Network Interface board (uGENI) for communications on GE Fanuc's Genius Distributed I/O Network.
- E. Acts as a high-performance FloPro Remote Message Unit by communicating over a high speed I/O network instead of a slower, serial based connection.
- F. Standard 9-pin RS232 communications port, for connection to a GE Fanuc PowerMate Motion Controller.

1.3 Hardware Description

The Operator Interface Unit (HE693OIU190) consists of five main components. They are:

- A) Keypad / Mounting plate.
- B) Main Circuit Board.
- C) Vacuum Fluorescent Display Circuit Board.
- D) Genius Network Interface (uGENI) Board.
- E) Steel Rear Cover.

The OIU is a microprocessor-based high-performance communications device. The core of the Main Circuit Board is the Intel 80C152 microprocessor running at 11.0592 MegaHertz. The “firmware” memory is contained in a programmable memory storage device. The Main Circuit Board is also equipped with 32K bytes of high-speed static RAM memory. There is no retained memory on the unit. The OIU incorporates a Genius Network Interface board (uGENI) that provides the link to the Genius network.

1.4 Specifications

Mounting Requirements:	Panel Mounting, NEMA 4-12
Communications:	Genius Network Interface (uGENI)
Additional Communications:	Standard RS232 for PowerMate.
Power Requirements:	12.5-32 VDC, 7.5 Watts power max.
Operating Environment:	0 to 60° C. (32 to 140° F). 0 to 95% humidity (non-condensing).
Non-Volatile Memory:	None

CHAPTER 2: INSTALLATION

2.1 Mounting Requirements

The OIU is designed for permanent panel mounting. To install the OIU:

- A. Cut the host panel as described by the drawing in Appendix A.
- B. Make sure all terminal connectors are removed from the OIU.
- C. Remove the steel back cover (if installed), by removing the screws securing it to the OIU. Carefully lift the cover off the rear of the OIU a few inches, disconnecting the power terminal from the power supply circuit board. The rear cover should now be completely free of the OIU.
- D. Remove the #6-32 hex nuts and washers from the outer mounting studs on the rear of the OIU panel.
- E. Insert the OIU module through the front panel cutout. The gasket material should lie between the host panel and the OIU panel.
- F. Install the #6-32 nuts and lock-washers on the six mounting studs of the OIU. Tighten these nuts until the gasket material forms a tight seal, do not overtighten.
- G. Re-install the rear cover. Be sure to re-connect the power terminal to the power supply circuit board. Re-connect all terminal connectors (power and Genius network terminals). This completes the mechanical installation of the OIU module.

2.2 Power Requirements

The OIU power supply requires a DC supply voltage between 12 and 32 volts. A maximum of 7.5 watts will be drawn by the OIU. The OIU power supply features a 2-position, removeable terminal block. See **Figure 2-1** for connector location. The pinout for this connector is shown below in **Table 2-1**.

Pin	Signal
1	+12-32VDC
2	DC Common

Table 2-1. DC connector pinout

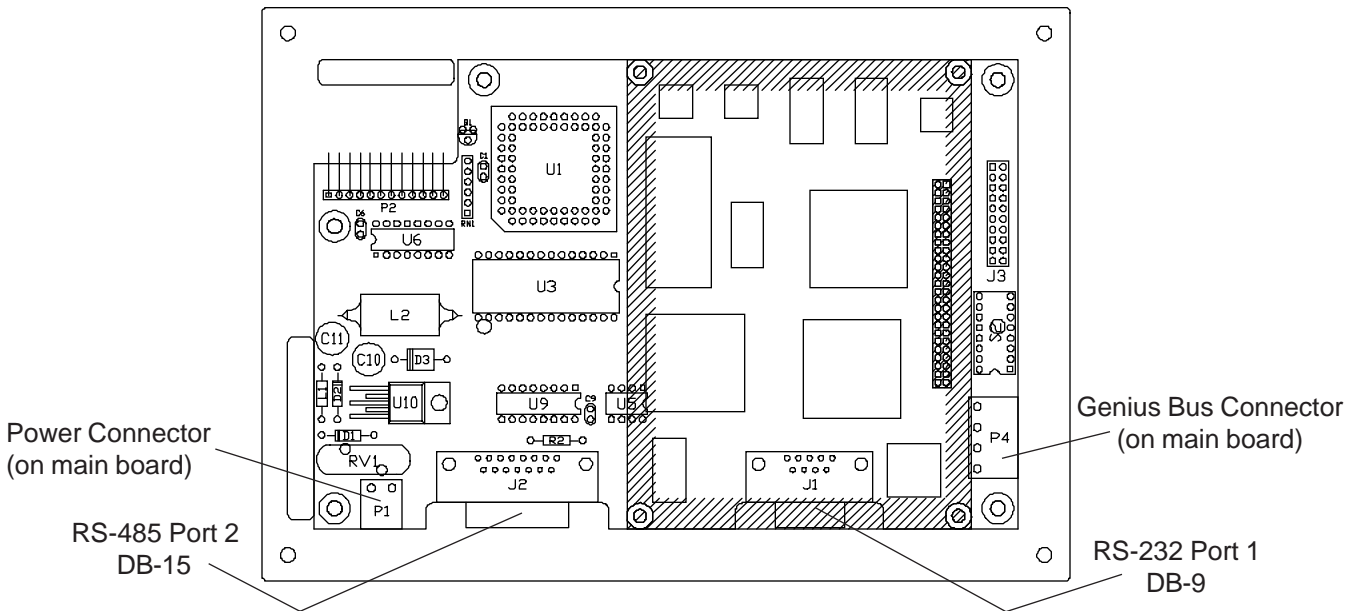


Figure 2-1. Connectors

2.3 Genius Network Connector

The OIU is also equipped with a 4-pin Genius bus connector. The mating connector provides screw terminals for each circuit. The pinout for this connector is as follows:

Pin	Signal
1	Serial 1
2	Serial 2
3	Shield Out
4	Shield In

Table 2-2. Genius Network Connector Pinout

2.4 RS232 Connector(s)

The 9-pin “D” connectors on the main circuit board provides an RS232 interface to the GE Fanuc PowerMate Motion Controller. The OIU-to-PowerMate cable pinout is shown in Appendix B.

2.5 uGENI Configuration

The uGENI board (located on the rear of the OIU module) is equipped with a bank of 8 “DIP” switches. DO NOT CONFUSE THIS DIP SWITCH WITH THE 6-POSITION DIP SWITCH ON THE MAIN CIRCUIT BOARD DESCRIBED LATER. These switches are used to configure the Genius “bus” address or “Device Number” for the OIU module, and to set the module’s Genius baud rate.

Each device on the Genius network must have a unique “Device Number” (0 to 31). The OIU may be configured for any device number, however the following conventions should be followed when choosing the device number for the OIU:

- A. The bus controller is usually configured as device number 31.
- B. The redundant bus controller (if any) is usually configured as device number 30.
- C. The Hand-Held monitor is usually configured as device number 0.

When shipped from the factory, the OIU dip switches are configured for device number 29, and for communication baud rate of 153.6K standard. Multiple OIUs may reside on the network, provided that they have unique device numbers. Available dip switch settings are illustrated in **Figure 2-4**.

2.6 OIU DIP Switches

The MAIN circuit board is equipped with a bank of 6 “DIP” switches. These switches are accessible by removal of the metal back cover. **The user should never need to change the default position(s)**. These switches are used to configure the following OIU options:

Switch #	Definition when Closed	Default
1	Always Closed	Closed
2	Always Closed	Closed
3	Always Open	Open
4	Power to Pin 5 of RS485 Port	Closed
5	Watchdog Timer Enabled	Closed
6	Run (Open for Serial Debug)	Closed

Table 2-3. MAIN board DIP Switch Assignments

2.7 Logicmaster 90-70 Configuration

The 90-70 Genius Bus Controller must be configured by Logicmaster to communicate with the OIU. The proper settings are as follows:

GENI-based device		
Config Mode:	manual	<i>*the proper bit memory type (%I, %M, %G, etc.) will be determined by GE Fanuc and Universal Automation</i>
To:	(bit type memory)*	
Input Length:	8	

2.8 FloPro Configuration

Consult documentation provided with Universal Automation FloPro for the configuration of Remote Message Units (OIUs) in FloPro.

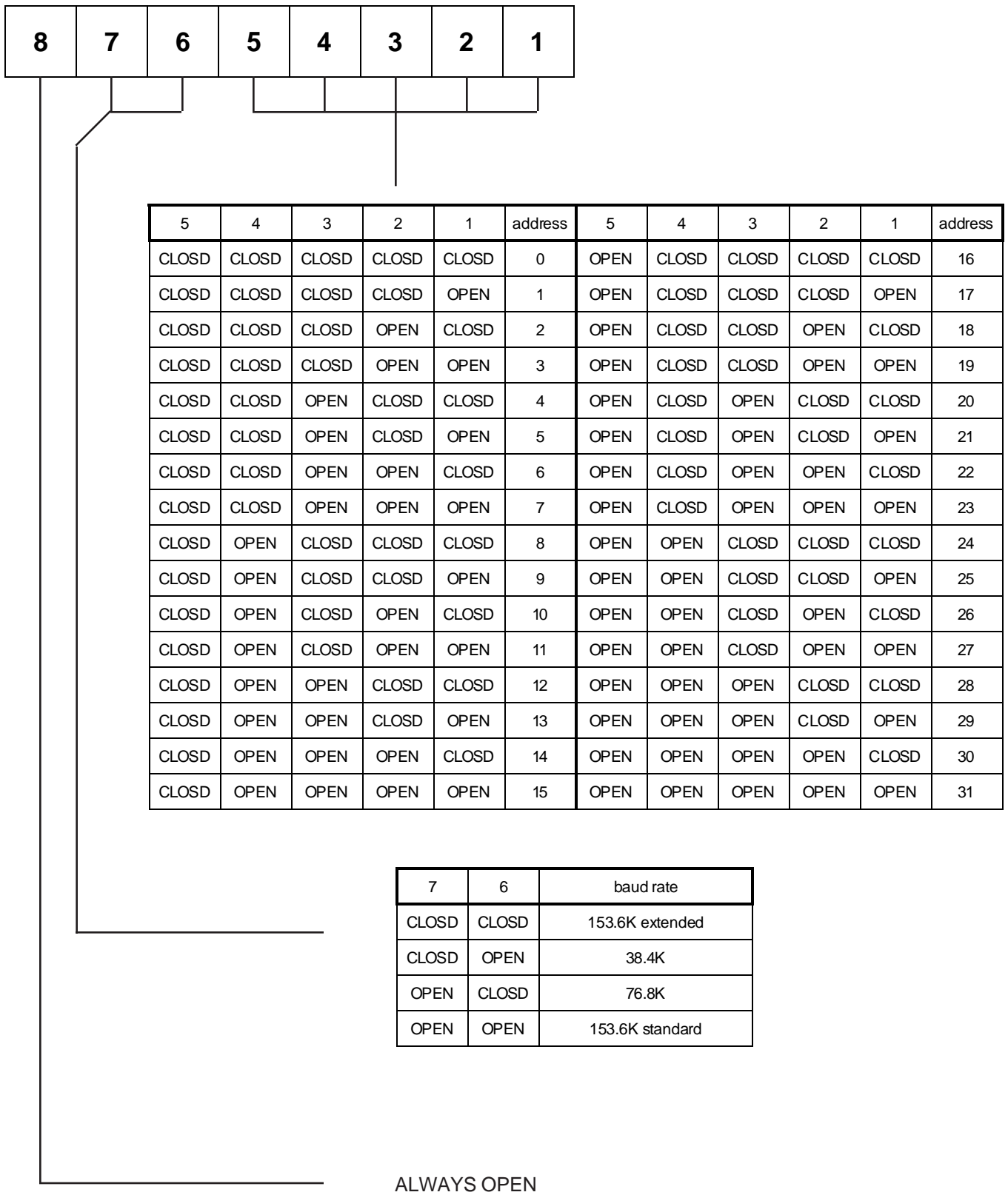
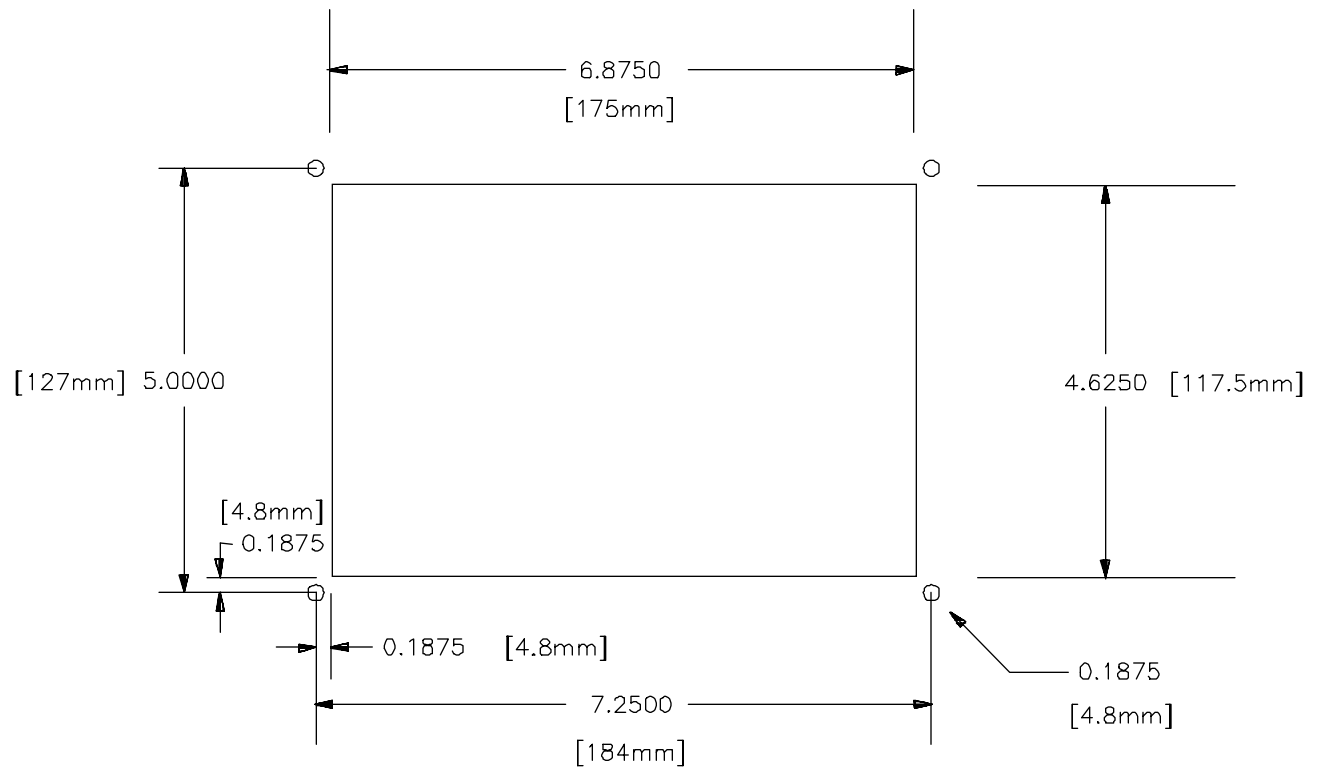


Figure 2-2. uGENI DIP Switch Assignments

APPENDIX A: PANEL CUTOUT

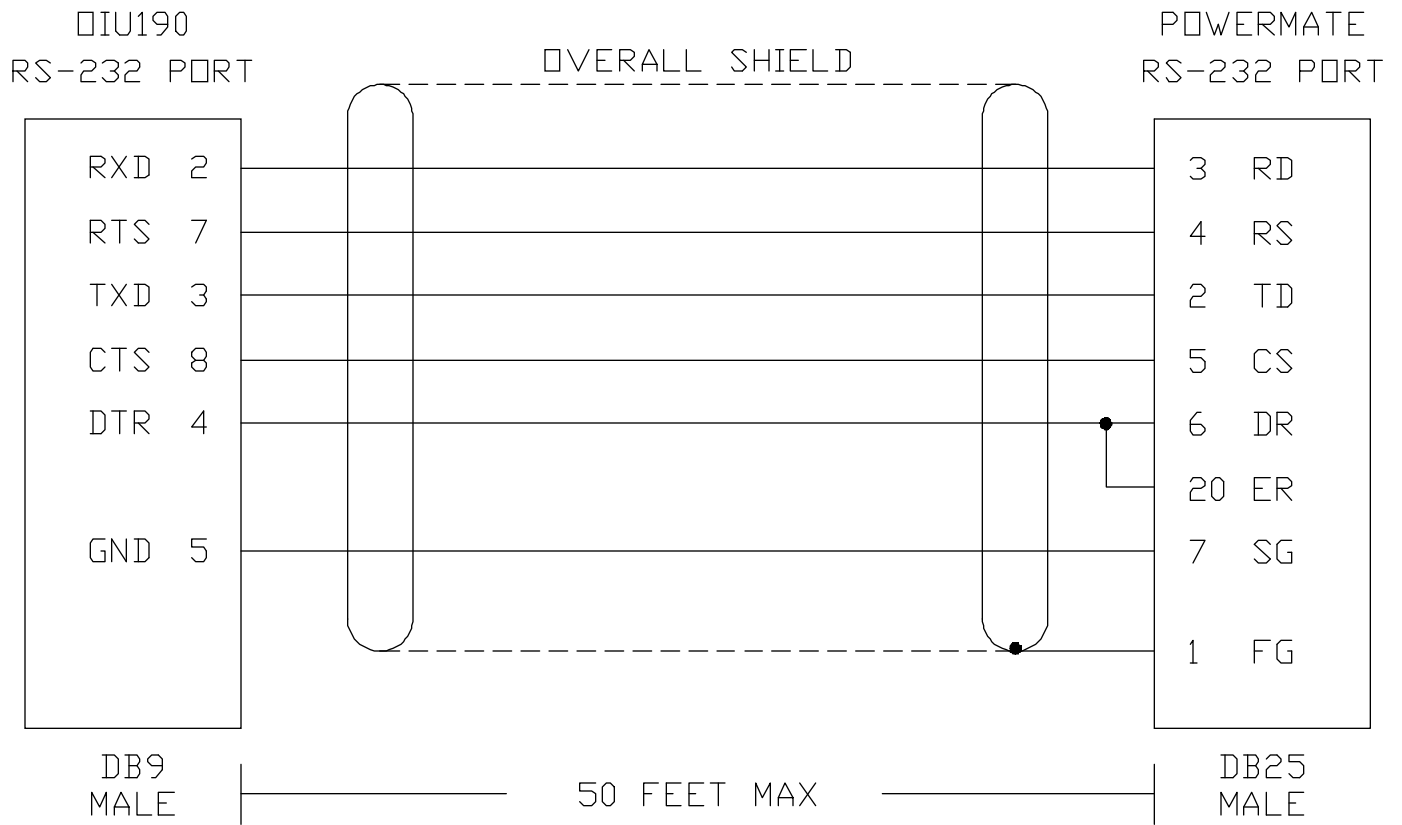
The OIU module is designed for panel mounting. The drawing below illustrates the panel cutout required for OIU module mounting. All dimensions shown in brackets are in millimeters, and those shown without brackets are in inches.



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APPENDIX B: RS-232 CABLE PINOUT

Following is the wiring diagram for the RS-232 cable for communications between the OIU190 serial port and the PowerMate Motion Controller Serial Port..



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APPENDIX C: DISPLAYABLE CHARACTERS

The following chart lists the characters which are displayable by the 4-line by 20 character vacuum fluorescent display. The ASCII code for each character is indicated by the row (first digit 0-F in hex) and the column (second digit 0-F in hex) in which the character resides. For instance, the character "q" is represented by ASCII code 17H.

2nd 1st	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		DP		0	@	P	`	p	Ç	É	á	α	§	À		≤
1		DC	!	1	A	Q	a	q	ü	æ	í	β		È		≥
2		DC	"	2	B	R	b	r	é	Æ	ó	γ		Ù		≠
3	DE		#	3	C	S	c	s	â	ô	ú	Δ	∫	Ë		⊥
4	DI		\$	4	D	T	d	t	ä	ö	ñ	ε				∞
5			%	5	E	U	e	u	à	ò	Ñ	η		Â		≈
6			&	6	F	V	f	v	å	û		θ	²	Ê		≡
7			'	7	G	W	g	w	ç	ù		λ	³	Î		⊕
8	BS		(	8	H	X	h	x	ê	ÿ	ı	μ		Ô		θ
9	HT		)	9	I	Y	i	y	ë	Ö		Π	√	Û		←
A	LF		*	:	J	Z	j	z	è	Ü	¬	ρ	±			→
B			+	;	K	[	k	{	ï	ø	½	σ		Γ		
C			,	<	L	\	l	|	î	£	¼	τ				
D	CR		-	=	M	]	m	}	ì	¥	ı	φ	UF			
E			.	>	N	^	n	~	Ä		«	Ω	UF			
F		RS	/	?	O	_	o		Å	f	»	Σ	UF		°	

Note: Characters with second digit "E" (column E above) are Russian Letters