

**HORNER  
ELECTRIC  
ADVANCED  
PRODUCTS  
GROUP**

# **Horner Electric's Release 3.4 Genius™ Operator Interfaces**

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**User's Manual Supplement, for**

*HE693OIU187, HE693OIU197,  
HE693OIU297, and HE693OIU907*  
**Revision B or later**



**PREFACE**

This manual explains how to use the Horner APG Genius Operator Interface Units for use with the CEGELEC Alspa 8000 family of Programmable Logic Controllers.

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**CHAPTER 1: INTRODUCTION****1.1 About this Manual Supplement**

This document is a supplement to Horner APG document (Horner *APG's Release 3.4 Operator Interface Units User's Manual*). It is intended to provide the necessary additional information to effectively integrate Horner APG's Genius Operator Interface Units. Users of this document should utilize the document to familiarize themselves with Horner Electric OIUs and their operational characteristics. Horner Genius OIUs operate nearly identically to the units described in this document.

**1.2 The Genius Network**

Horner APG offers a variety of Operator Interface products. The Horner Electric product line includes models communicating serially (using SNP protocol) and over a high speed industrial LAN (Genius). The Genius LAN is a proven, industrial rugged high speed LAN. Relative to typical RS-232 or RS-485 serial communications, it offers far better performance and flexibility. Genius is a token passing network with baud rates up to 153.6kbaud, consisting of up to 32 devices. Devices available for the Genius LAN include PLC interfaces, a wide variety of I/O Blocks, personal computer interfaces, variable frequency drive interfaces, and a host of third party devices.

**1.3 The Advantages of Genius Operator Interface**

No Dedicated Cabling or PLC Interface. Operator Interfaces may be located remotely, using the same cabling and PLC interface modules as the distributed I/O. For instance, instead of a PLC Coprocessor or Communications card and dedicated RS-485 cabling, the Genius OIU can reside on the same cable as the existing Genius I/O Blocks, acquiring data from the existing Genius bus controller.

Multiple, Distributed OIUs without Significant Performance Sacrifice. Many OIU manufacturers have schemes where a "Master" OIU communicates with the PLC serially and then passes data on to "Slave" OIUs connected to the master. These schemes, while possessing some merit, offer significant performance decreases as additional OIUs are added to the master. Several Genius OIUs residing on a single Genius bus each typically offer higher data updates than a single master serial OIU, let alone a single OIU distributing data to several slave OIUs.

Data Access from I/O Blocks without PLC Intervention. Horner APG Genius OIUs can be used on Genius networks without PLCs. For example, Horner OIUs can be connected via Genius directly to one or more PowerTRAC blocks to display the power data being gathered by the blocks. A PLC bus controller is not required, as the OIU has the ability to communicate with the PowerTRAC block directly without the need to go through a PLC interface.

**1.4 The OIU as a Genius Device**

Like any other Genius device, Horner Genius OIUs reside on the LAN and must be configured with a Serial Bus Address, 0 to 31. On the OIU, this Genius bus address is set via an 8 position dip switch, which is also used to set the baud rate. The Genius hardware interface is a GENI printed circuit board, which is one of the two printed circuit boards which make up the OIU. As a GENI-based device, Horner Electric OIUs are intelligent and can read and write all forms of data on the network.

## 1.5 Genius Data

There are two means of data transfer on the Genius network, global data and datagrams.

**Global data.** Global data is data broadcast by Genius devices blindly onto the network. The data is not directed to any particular Genius device, but is available to all devices on the network with the ability to read and process the data. The Horner Electric Genius OIUs can read up to 64 words of global data from each device, and broadcast up to 64 words of its own global data output. A common useage of global data output by the OIU would be to broadcast the state of its function keys as global data. Any device (such as a Genius bus controller) with the ability to read and interpret global data then has the ability to detect the pressing of one or more function keys.

**Datagrams.** Datagrams are a directed message from one Genius device to another. Datagrams are commonly used by the Genius OIUs to display PLC data. Whenever the OIU needs to know the status of a PLC register not broadcast as global data, the OIU will send a datagram to the Genius bus controller requesting this information. The bus controller then processes the message and sends a datagram response to the OIU which includes the requested data.



## 1.6 Model Features

Operator Interfaces	OIU187	OIU197	OIU297	OIU907
<b>Features</b>				
Genius Connection				
RS-232 Port for Programming				
20 key Numeric Keypad				
Programmable Function Keys	12	12	14	12
I/O Mapped LED's				
2 x 16 Liquid Crystal Display				
2 x 20 Vacuum Fluorescent Display				
4 x 20 Vacuum Fluorescent Display				
Character Height	.375"	.197"	.197"	.44"
Real-time Calendar Clock				
Configurable with IBM Software				
Configurable from Keypad				
Alarm Enunciation Capability				
Serial Printer Support				
Double Integer Read/Write				
Performs Linear Scaling ( $mx + b$ )				
Genius Redundancy				
Eight User Definable Characters				
Message Chaining				
Keypad Masking to Disable Indiv. Keys				

Table 1-1. Feature List by Model Number.

## 1.7 Model Specifications

Operator Interfaces	OIU187	OIU197	OIU297	OIU907
<b>Specifications</b>				
NEMA Rating	4-12			
Height (inches)	5.50"	5.50"	5.50"	7.25"
Height (millimeters)	140	140	140	185
Width (inches)	7.75"	7.75"	7.75"	11.75"
Width (millimeters)	197	197	197	299
Mounting Depth (inches)	2.13"	2.13"	2.63"	3.50"
Mounting Depth (millimeters)	54	54	67	89
24VDC Power Requirements (mA)	250	250	500	500*
DC Power On Current Surge (A/ms)	1/30	1.5/50	2.1/100	3/100
85-267VAC Power Requirements (mA)	NA	NA	NA	500
AC Power On Current Surge (A/ms)	-	-	-	8/25
Operating Temperature	0 to 60°C			
Relative Humidity (non-condensing)	5 to 95%			

NA = not available, \* = optional (-24 suffix)

**Table 1-2.** Specifications List by Model Number.

<b>CHAPTER 2: APPLICATION DEVELOPMENT</b>
-------------------------------------------

This chapter lists the additional features available with Horner Electric Genius OIUs. For descriptions of all the available features, once again reference document HFK-XX7.

## 2.1 Using the Genius OIU to Display PLC Data

The Horner Electric Genius OIUs display data in the same fashion as the SNP OIUs, but differ slightly in the use of the Block Number parameter and also offer additional Reference Types. The Data Field Type, Range, and Base are identical to those used with SNP OIUs.

### 2.1.1 Block Number

The Genius OIUs utilize the "Block Number" parameter to specify the Genius Bus Address of the device containing the data to be displayed on the OIU, from 0 to 31.

### 2.1.2 Reference Type

The Genius OIUs offer more reference types than the SNP OIUs, due to the fact that they can access data from Genius Blocks as well as PLCs. Therefore they feature all PLC Reference Types, plus some Genius Reference Types. Supported Reference Types are listed in the Table(s) below:

Reference Type	Description	Default # of Bits
%R	Register Memory	16
%AI	Analog Input	16
%AQ	Analog Output	16
%I	Discrete Input	1
%Q	Discrete Output	1
%T	Temporary Coils	1
%M	Internal Coils	1
%S	System Memory	1
%SA	System Memory	1
%SB	System Memory	1
%SC	System Memory	1
%G	Genius Global Data	1

**Table 2-1.** PLC Reference Types

Reference Type	Description	Default # of Bits
BIO	Discrete Genius I/O	1
BAI	Analog Block Input	16
BAQ	Analog Block Output	16
PWR	PowerTRAC Block Data	16
CFG	Block Configuration Data	8
FLT	Block Diagnostic Data	8
GLB	Genius Global Data	16

**Table 2-2.** Genius Reference Types

## 2.2 Function Keys

Function keys are also utilized identically as with SNP OIUs. However, when used as momentary pushbuttons, they are typically applied in a slightly different fashion.

### 2.2.1 Function Keys as Momentary Pushbuttons

To map the function keys into PLC I/O as a pushbutton, the **function key register** must be set. The function key register is a register in the PLC which is constantly updated by the OIU with the status of the function keys and/or other keys on the OIU keypad.

If the function key register is assigned to a PLC Reference Type (%M, %T, %R etc.), the Block Number for the function key register must reference a PLC bus controller. Every time a function key is pressed, the OIU will send a datagram to the bus controller, and that datagram will cause the appropriate register or bit value to change.

An alternate way to map function keys is to map them as OIU Global Data Output. In this case, the Block Number must reference the OIU Genius Bus Address, and the GLB Reference type must be used. The status of all the OIU keys will be mapped into Global data, and the current state of all the keys will be broadcast continuously as Global Data by the OIU. All the keys will be broadcast due to the fact that GLB is a word-type reference.

If the function keys are mapped to global data, the "Global Data Output Size" must be set to a non-zero value. Otherwise, the OIU will not broadcast any global data, and the function key status will not be broadcast. For information regarding which keys are mapped to which bits, see the HFK-XX7 document.

## 2.3 Using a Genius OIU with the Series 90-30 PLC

There are currently three different Genius interface modules for the Alspa 8000 PLCs. These include the Genius Communications Module (GCM), Enhanced Genius Communications Module (GCM+), and the Genius Bus Controller (GBC).

Genius Communications Modules (GCM and GCM+). These modules simply support global data. They cannot be used to control Genius I/O and they also do not support datagram data access. When a Genius OIU is used with a GCM or GCM+, the OIU can only display the global data broadcast by the module, which is limited to 64 words. Also, the OIU can write only 64 words of global data which is readable by the module.

The Logicmaster Configuration software is used to map incoming global data from the other Genius devices to PLC registers. Independent blocks of PLC registers are configured for each of the other devices residing on the network. Also, the PLC registers containing the global data to be output by the PLC are also mapped.

For instance, let's say that a Genius OIU has Genius bus address of 20, and is configured with 46 words of global data output. Let's also say that a GCM+ has a Genius bus address 16, and broadcasts %R1-64 as global data output from the PLC. A sample Logicmaster configuration screen for this scenario is shown below:

SERIES 90-30 MODULE IN RACK 2 SLOT 3						
SOFTWARE CONFIGURATION						
SLOT	Catalog #:		ENHANCED GENIUS COMM MODULE			
3	IC693CMM302					
CMM302	%I,%Q,%G lengths are bits; %AI,%AQ,%R are words					
GENCOM	SBA	Start Ref	Reference Length	Msg Buffer	Byte	Offset
	15	%Q0481	0			0
	*16	%R0001	64			0
	17	%G0033	0			0
	18	%G0065	0			0
	19	%G0097	0			0
	20	%R0101	46			0
	21	%G0161	0			0
	22	%G0193	0			0
	23	%G0225	0			0

As you can see from the above configuration, data broadcast by the OIU is mapped into PLC registers %R101-%R146, and data broadcast by the PLC is located at %R1-%R64.

Genius Bus Controller (GBC). Unlike GCM and GCM+ modules, Genius Bus Controllers (GBCs) have the ability to control I/O and communicate using datagrams. Therefore the OIU can access all of the PLC memory table via datagrams, as well as monitoring up to 64 words of global data output from the PLC. The datagram access provides full read/write access to the PLC memory, allowing the OIU and PLC ladder logic to read/write the PLC register space. Even with datagram access, global data is still commonly used in GBC/OIU applications. For instance, data commonly broadcast by the OIU (function key status, current screen number, and print status) is often mapped as global data outputs. This is an effective way of managing routinely broadcast data while minimizing datagram traffic.

In the sample Logicmaster configuration below, the OIU has a Genius bus address of 29, and broadcasts 4 words of global data. Words 1 and 2 contain keypad status bits, broadcasting the status of all (up to) 32 OIU keys. Word 3 contains the Current Screen Number, and Word 4 contains the Print Status Register.

SERIES 90-30 MODULE IN RACK 2 SLOT 4						
SOFTWARE CONFIGURATION						
SLOT	Catalog #:		9030 GENIUS BUS CONTROLLER			
4	IC693BEM331					
BEM331	%I,%Q,%G lengths are bits; %AI,%AQ,%R are words					
GBC	----- BUS CONTROLLER MODULE DATA -----					
	Module SBA :	31	Baud Rate :	153K STD	Input Def :	OFF
	S6 Ref :	0	Status :	%I0097	Out at strt:	ENABLED
	----- DEVICE DATA -----					
	Device SBA :	29	Input1 Ref :	%R0100	Input1 Len :	4
	Device Type:	GENERIC	Input2 Ref :	%AI0002	Input2 Len :	0
			Output1 Ref:	%Q0065	Output1 Len:	0
			Output2 Ref:	%AQ002	Output2 Len:	0

2.4 Using a Genius OIU with the 90-70 PLC

When using a Genius OIU with the 90-70 PLC, the OIU is configured as a "GENI-based Device".

		Rack 1 Slot 2 Bus 1
		SOFTWARE CONFIGURATION
BUS ADDR 29	Catalog #:	GENI-BASED GENIUS NET I/FACE-global data
ELB 905	----	RECEIVE GLOBAL DATA ----
GENIBAS	Config Mode:	MANUAL Redundancy?: NO
	To :	%R00001 Input Def : OFF
	Input Len :	4

The "To" and "Size" fields configures the PLC for the amount of global data being broadcast by the OIU and the location in PLC memory where it is to be mapped.

**CHAPTER 3: THE KEYPAD SETUP MENU**

This chapter describes the differences in the operation of the Genius OIUs from the built-in Setup Menu. For a greater understanding of the function or purpose of the OIU features, see Chapter 3, "Application Development". **Genius OIU models without a numeric keypad (such as the OIU297) do not support the setup menu. These units may only be setup from the OIU configuration software.**

### 3.1 Genius Menu Selections

The additional menu choices are listed below:

```
> GENIUS SETUP
   Cfg DGRAM FRQ
```

### 3.2 Genius Setup

This menu selection performs a variety of Genius configuration functions. The configuration functions varies slightly by model. For instance, the OIU297 and OIU907 receive their Genius Bus Address and Genius Baud Rate configuration from an 8-position dip switch. The OIU187 and OIU197, however, use either the setup menu or the configuration software to perform this task. Each of the Genius OIUs, however, uses this menu selection to configure the number of Global Data Output words, Reference Address, and CPU redundancy register.

After selecting the Genius Setup menu item, the screen appears as follows (OIU187 and OIU197 only):

```
enter genius bus
address: 29
```

The user may set the address either by pressing the UP and/or DOWN arrow keys. Once the desired Genius Bus Address is displayed, the ENTER key must be pressed for the change to take effect. Alternatively, the desired Genius Bus Address may be keyed in from the numeric keypad, followed by ENTER.

After the Genius Bus Address has been configured (by pressing ENTER), the screen appears as follows (OIU187 and OIU197 only):

```
enter genius baud
rate: 153.6k std
```

The desired Genius Baud Rate may be selected by pressing the UP and/or DOWN arrows. The ENTER key must then be pressed for the change to take effect.

The Global Data Size is the next parameter to be configured (the first to be configured on the OIU297 and OIU907). The screen appears as follows:

```
enter global data
size: 0 words
```

The number of Global Data Output Words is set either with the UP and/or DOWN arrows followed by ENTER, or by keying in the value (0 to 64) followed by ENTER.

After configuring the Global Data size, the screen appears as follows:

```
enter reference  
address: 0
```

The Reference Address is set either with the UP and/or DOWN arrows followed by ENTER, or by keying in the value (0 to 32767) followed by ENTER. A value of zero disables the feature.

After configuring the Reference Address, the screen appears as follows:

```
cpu redund. reg  
00%R
```

To set the CPU Redundancy Register, press the LEFT and RIGHT arrow keys to select the Block Number (usually 31) of the Genius Bus Controller. Press the UP and DOWN arrow keys to select the reference type. The register number is then keyed in from the numeric keypad, and the pressing the ENTER key completes the process.

### 3.3 Cfg Dgram Frq

After selecting the Cfg Dgram Frq menu item, the user is prompted with the following display:

```
Enter max dgram  
freq: 4/sec (lo-p)
```

Pressing the UP and DOWN arrows toggles this selection between the 12 possible settings, 1, 2, 4, 8, 20, or MAX datagrams/second with either high or low priority. Pressing ENTER is required for the change to take effect.



**CHAPTER 4: SOFTWARE CONFIGURATION**

This chapter describes the different software configuration items present for the Genius OIUs. For complete, step-by-step, detailed instructions, see the HFK-XX7 document

#### 4.1 Miscellaneous Register Menu

Horner Electric Operator Interface Unit Setup Utility U3.42 OIU157			
<b>MISCELLANEOUS REGISTER CONFIGURATION</b>			<b>MISC REGISTER MENU</b>
<b>FUNCTION</b>	<b>BLK</b>	<b>REGISTER</b>	<b>BITS</b>
FUNCTION KEY LED	0 ---	%M 00001 ---	00012 ---
TRIGGER	0	%R 00100	00-15
CURRENT SCRNM	0	%R 00101	00-15
PRINT	0	%R 00102	00-15
PRINT STATUS	0	%R 00103	00-15
CLOCK	0	%R 00097	-----
EXPANSION	---	-----	-----
REDUNDANCY	---	-----	-----
KEYPAD MASK	0	%R 00104	00-31

▼▲◀▶ = Move Cursor  
 SPACE = Select type  
 0-9 = Enter block/register  
 +/- = Adjust bits

Note that some of the registers may not be supported by the module that you have.

ESC = Main Menu

Press SPACE to cycle through the available register 'types'. Numerically enter the register offset value.

**Figure 4-1.** Miscellaneous Registers Screen

Genius OIUs utilize the "Redundancy" Register, which is not used by SNP OIUs. Like editing any miscellaneous register parameter, the cursor keys are used to position the cursor from line to line and column to column. When the "Register" column is edited, pressing the SPACE bar toggles between the available reference types. The Register number and "Block" number may be keyed in from the keyboard. The + and - keys are used to increment/decrement the "Bits" column.

## 4.2 The Autorun Menu

In addition to the parameters supported by all OIUs, the Autorun Menu contains Genius Setup parameters for the Genius OIUs. This screen is shown below.

Horner Electric Operator Interface Unit Setup Utility V3.54 OIU187							
<table border="1"><tr><td>Enter AUTORUN mode after OIU download</td></tr><tr><td><b>NO</b></td></tr></table>	Enter AUTORUN mode after OIU download	<b>NO</b>	<table border="1"><thead><tr><th>AUTORUN MENU</th></tr></thead><tbody><tr><td>0-9 = Enter Screen # SPACE = Toggle Parameter TAB = Select Field</td></tr><tr><td>ESC = Main Menu</td></tr><tr><td>Press SPACE to select AUTO mode, TAB to advance to the next field.</td></tr></tbody></table>	AUTORUN MENU	0-9 = Enter Screen # SPACE = Toggle Parameter TAB = Select Field	ESC = Main Menu	Press SPACE to select AUTO mode, TAB to advance to the next field.
Enter AUTORUN mode after OIU download							
<b>NO</b>							
AUTORUN MENU							
0-9 = Enter Screen # SPACE = Toggle Parameter TAB = Select Field							
ESC = Main Menu							
Press SPACE to select AUTO mode, TAB to advance to the next field.							
<table border="1"><tr><td>Genius Address: 29 Baud Rate: 153K STD</td></tr><tr><td>Max Genius Datagram frequency 4 Msg/Sec, LO-P</td></tr><tr><td>0 Global Words</td></tr><tr><td>Ref Address: 0</td></tr></table>	Genius Address: 29 Baud Rate: 153K STD	Max Genius Datagram frequency 4 Msg/Sec, LO-P	0 Global Words	Ref Address: 0			
Genius Address: 29 Baud Rate: 153K STD							
Max Genius Datagram frequency 4 Msg/Sec, LO-P							
0 Global Words							
Ref Address: 0							

Figure 4-2. Auto/Startup Screen

**APPENDIX A: INSTALLATION INFORMATION**

This appendix lists all the pertinent installation information for each of the OIU model numbers. Panel installation, power connection, dip switch settings, communications diagrams, etc.

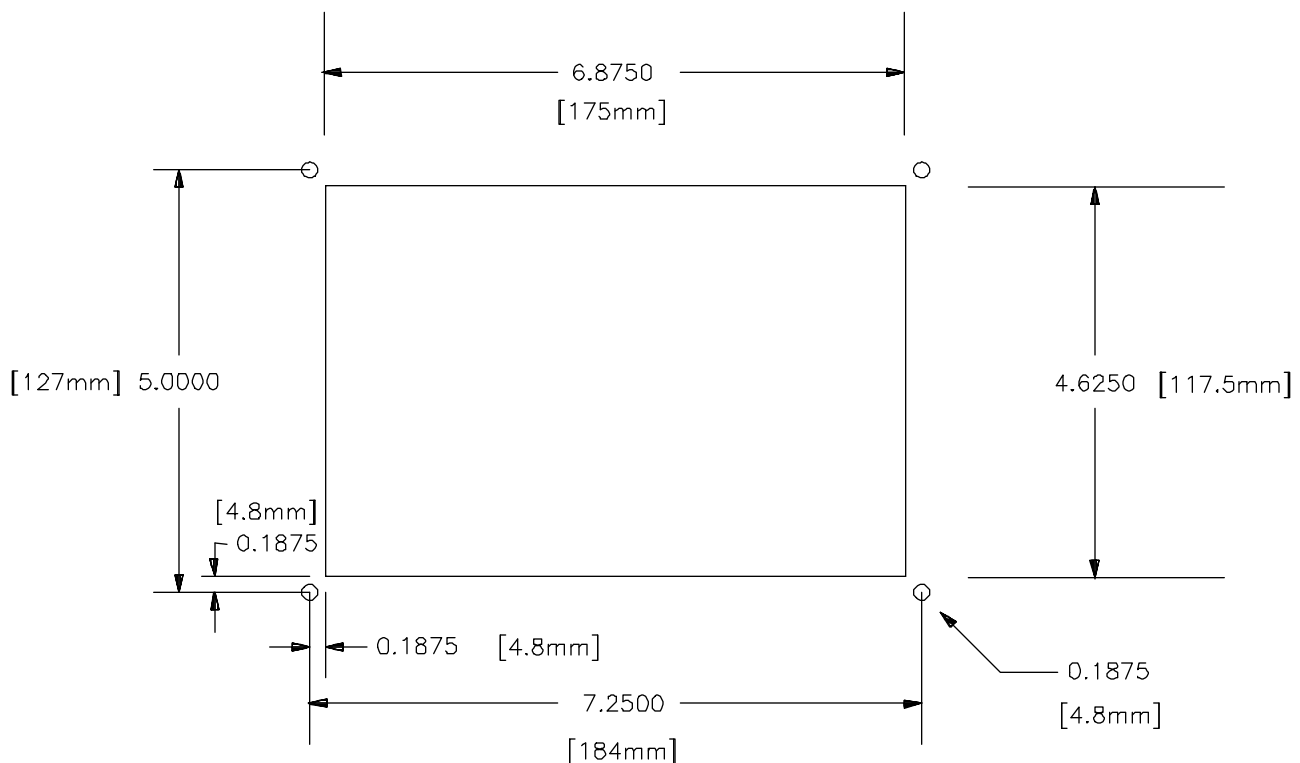
**A.1 Mounting****A.2 Providing Power****A.3 Communications Wiring****A.4 Placing the Module Into Service**

# Mounting

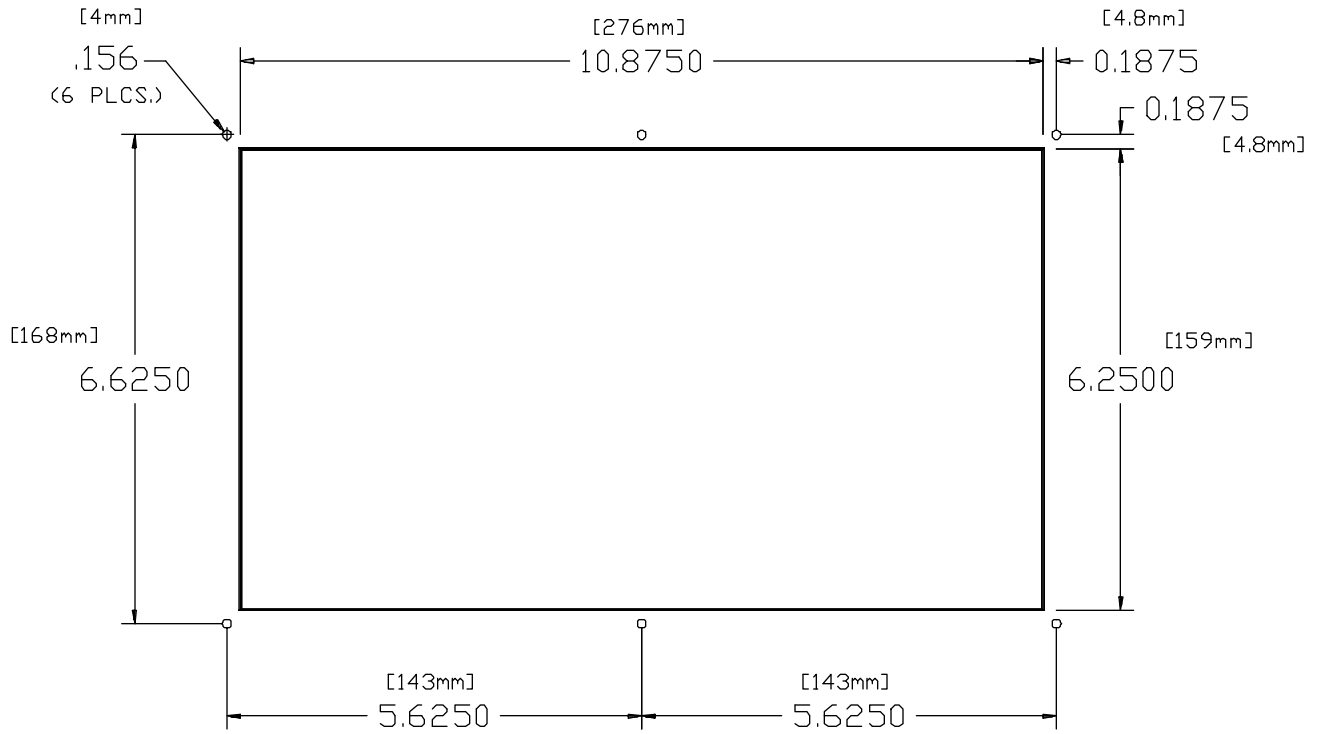
## A1.1 Mounting Requirements

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

- A. Cut the host panel as described in the corresponding drawing below:
- B. Remove the rear cover by removing the four (4) [OIU907] or five (5) [OIU187, 197, and 297] screws holding it in place.
- C. Insert the OIU through the panel cutout (from the front). The gasket material should lie between the host panel and the OIU panel.
- D. Install four (4) [OIU187, 197, and 297] or six (6) [OIU907] #6-32 hex nuts on the mounting studs of the OIU. Tighten these nuts until the gasket material forms a tight seal. Do not overtighten.
- E. Replace the rear cover screws which secure it to the OIU.
- F. Connect the communications and/or printer cables to the OIU serial ports.



**Panel Cutout for HE693OIU187, OIU197, and OIU297**

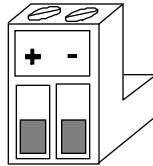


**Panel Cutout for HE693OIU907**

# Providing Power

## A2.1 Power Requirements for the HE693OIU187, HE693OIU197 and HE693OIU297

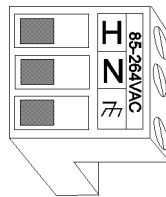
These three operator interface units, which feature vacuum fluorescent displays, must be powered from 9-32V DC. Power is provided to the OIUs through a two position removable terminal strip. The polarity of this connection is shown below:



**Power Connection for the HE693OIU187, HE693OIU197 and HE693OIU277**

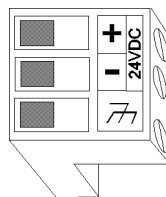
## A2.2 Power Requirements for the HE693OIU907

The OIU907 unit requires AC power, standard. They accept a wide range AC input, 85-267VAC, 40-440 Hz.



**Power Connection for the HE693OIU907**

This unit may optionally be DC powered, from 9-32VDC, with a (-24) suffix added to the part number. This power must be supplied to the three position removable terminal strip mounted on the rear cover of the OIU. The terminal connection is as follows:

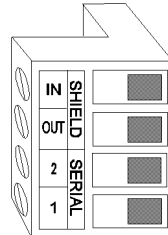


**Power Connection for the HE693OIU907-24**

# Communications

## A3.1 Genius Communications Wiring

All of the OIUs described in this manual communicate with Genius through a 4-pin, removable terminal strip. The connections provided are identical: Serial 1, Serial 2, Shield Out and Shield In. Shielded, twisted pair wiring should be used. *For exact wiring specifications, refer to document GFK-0412, the Genius Communications Users Manual.*



**Genius Terminal Connections for HE693OIU187, HE693OIU197,  
HE693OIU297 and HE693OIU907**

## A3.2 Installation Considerations

In addition to construction, proper cable routing is of utmost importance. Communications cabling should be routed away from high power and I/O wiring, as electrical noise from these conductors can be induced upon the communications cabling. Once again, *for exact wiring specifications, refer to document GFK-0412, the Genius Communications Users Manual.*

## A3.3 Genius Communications Settings (OIU187 and OIU197 only)

In order for the Operator Interface Units to communicate properly via Genius, they must be configured with the proper Genius baud rate and assigned a Genius bus address. The OIU 297 and OIU907 utilize dip switches to accomplish this configuration, but the OIU187 and OIU197 use the configuration software (OIUCFG.exe). To reach the appropriate sub-menu, invoke the OIUCFG software from DOS and select the proper OIU model (OIU187 or OIU197). From the Main Menu, select F8 "Select Auto/Setup Mode". This screen contains the Genius configuration parameters, which include baud rate and Genius bus address, shown below:

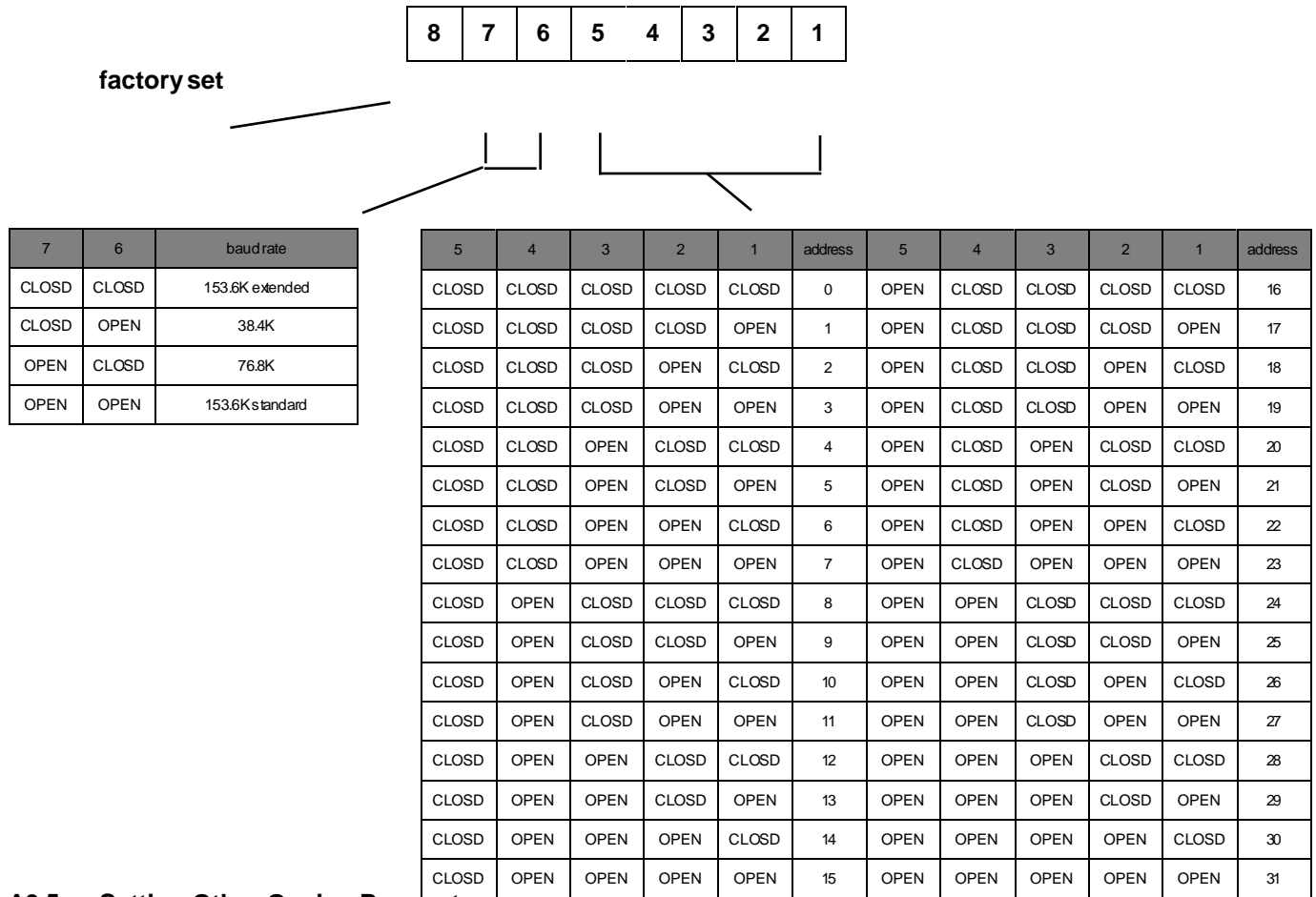
Genius Address: 29
Baud Rate: 153K STD
Max Genius Datagram frequency 4 Msg/Sec, L0-P
0 Global Words
Ref Address: 0

### OIU187 and OIU197 Software Configuration for Genius Bus Address and Baud Rate

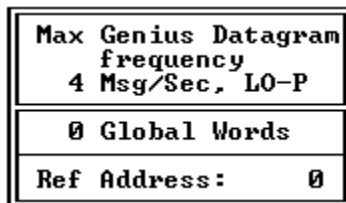
Legal baud rates include 153K Standard, 153K Extended, 76K and 38K. The other Genius parameters shown above are covered elsewhere in this document.

**A3.4 Genius Communications Dip Switches (OIU297 and OIU907 only)**

The OIU907 features an 8-position dip switch for configuring the Genius baud rate and device number for the OIU. This is accessible through an access hole in the rear cover of the OIU, and its settings are listed as follows:



**A3.5 Setting Other Genius Parameters**



**Software Configuration for Genius Datagram Frequency, Global Words, and Reference Address**

There are several other parameters important in a Genius OIU application. They can be set via the OIU Software or through the OIU keypad (except the OIU297). The parameters are as follows:

**Genius Datagram Frequency.** Datagrams are messages from one device to another directed over Genius. The user can set the maximum frequency at which the OIU will generate datagrams. This can help balance update time with Genius bus traffic. In some applications with very active buses, a slower datagram frequency is desired to prevent problems on the bus due to over traffic. The valid selections are 1/sec, 4/sec, 8/sec, 20/sec and Maximum. The priority can also be set to low or high. High priority datagrams are processed immediately, while low priority datagrams are placed in a que and processed in order. **High priority datagrams should be used only if the datagram access is extremely critical in nature.**



**Global Words.** This parameter sets the number of global data output words that the OIU will continually broadcast. This number can be between 0 and 64 words. The value should be set to non-zero only if global data output will be used. Common useage for OIU global data output is for data transfer to Series 90-30 GCM or GCM+, or for the broadcast of function keys and/or current screen information. If global data output is not to be used in the application, this parameter should be set to zero.

**Reference Address.** This parameter is typically used in applications with the Series Six PLC. In all other applications the default value is sufficient. For use in a Series Six application, contact Horner Electric Technical support for application details.

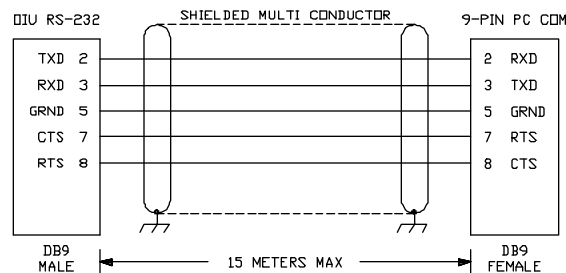
MISCELLANEOUS REGISTER CONFIGURATION			
FUNCTION	BLK	REGISTER	BITS
FUNCTION KEY	0	%R	-----
LED	0	%R	-----
TRIGGER	0	%R	-----
CURRENT SCRNM	0	%R	-----
PRINT	0	%R	-----
PRINT STATUS	0	%R	-----
CLOCK	0	%R	-----
EXPANSION	0	%R	-----
REDUNDANCY	31	<del>GWB</del>	-----
KEYPAD MASK	0	%R	-----

**Genius Redundancy Register (Contained on Misc. Register Screen)**

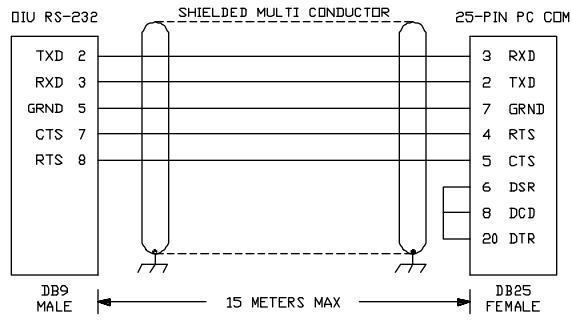
**Redundancy Address.** If using the OIU with redundant Genius bus controllers (GBC), addressed 31 and 30, the OIU will monitor a Global Data Output Word from address 31. This word ("the Redundancy Address") should have a constant decimal value of 1 as set in the PLC ladder logic. The OIU constantly monitors that Global data output word and clears it every time it is read. If device 31 goes down, it will no longer transmit that global data output word as a "1", and the OIU will realize that there is a problem with device 31. The OIU will then fill all its data fields originating from device 31 from device 30 instead. When GBC 31 returns to health and resumes transmitting the redundancy address as a 1, the OIU switches back to reading data from device 31.

**A3.6 RS-232 Communications Wiring**

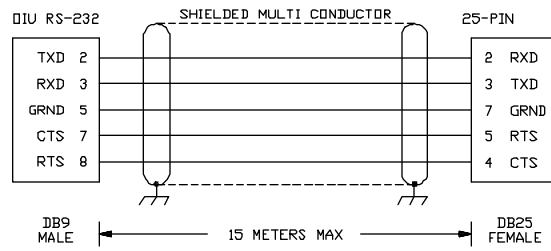
The OIUs feature an RS-232 port for connection to a personal computer (for programming the OIU) or a serial printer. Wiring diagrams for the RS-232 port are shown below. Shielded, multiple pair wire should be used. Note that for serial printers, pinouts vary. Check the user's manual provided with the serial printer for verification of pinout.



**OIU RS-232 port to 9-pin personal computer serial port.**



**OIU RS-232 port to 25-pin personal computer serial port.**



**OIU RS-232 port to Typical Serial Printer (check pinout on your printer).**

# Placing the OIU into Service

## A4.1 General Considerations

Even though the OIUs have been designed for use in industrial environments, the installation of the unit has a huge impact on its immunity to noise. A number of considerations must be made when placing the OIU into service to ensure years of reliable operation. A listing of some of these considerations follows:

### ***Secure Physical Mounting***

The OIU should be securely mounted, isolated from severe vibration.

### ***Ground the OIU Chassis***

The OIU chassis should be connected to a good earth ground. This connection should be made to one of the OIU's four or six mounting studs. These studs provide a direct connection to the OIU chassis, to which all OIU printed circuit board earth ground connections are made. Generally, with the OIU chassis grounded electrical noise can be effectively shunted to earth ground.

### ***Install the OIU Rear Cover***

The OIU's steel rear cover provides important protection against RF (radio frequency) interference.

### ***Use Proper Communications Cable and Wiring Techniques***

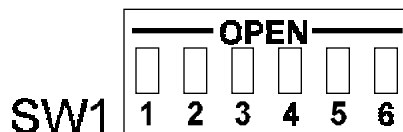
Make sure that the proper Genius communications cabling has been selected, and that proper installation techniques have been followed. *For exact wiring specifications, refer to document GFK-0412, the Genius Communications Users Manual.*

### ***Route Power Wiring Properly***

When using OIUs using 24V or 120/240VAC power, route the OIU power conductors away from noise inducing electrical components and wiring.

### ***Dip Switch Settings***

The Genius OIUs have 6-position dip switches which generally do not require modification from the Factory Default. For User information, their proper settings and meanings are shown below:



Dip Switch 1, present on OIU187, OIU197,  
OIU297, and OIU907

Switch #	Name	Definition when Closed	Default
1	NVE	NV-RAM Writable	Closed
2	NVD	Not Used	Closed
3	NVF	NV-RAM Site FLASH	Open
4	C64	System EPROM size 64K	Closed
5	WDE	Watchdog Timer Enabled	Closed
6	SW6	Not Used	Closed

**Dip Switch 1 Settings on OIU187 and OIU197.**

Switch #	Name	Definition when Closed	Default
1	NVE	NV-RAM Writable	Closed
2	NVD	Always Closed	Closed
3	NVF	NV-RAM is 32K FLASH	Open
4	PWR	+5V Output at RS-485 Port	Open
5	WDE	Watchdog Timer Enabled	Closed
6	SW6	Always Closed	Closed

**Dip Switch 1 Settings on OIU297.**

Switch #	Name	Definition when Closed	Default
1	NVE	NV-RAM Writable	Closed
2	NVD	Always Closed	Closed
3	NVF	NV-RAM is 32K FLASH	Open
4	C64	System EPROM size 64K	Closed
5	WDE	Watchdog Timer Enabled	Closed
6	SW6	U.S./ Japanese Character Set	Closed

**Dip Switch 1 Settings for the OIU907 and OIU907-24.**