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Bulletin No. PAPBH-X
Drawing No. LP0525
Effective 6/01

MODEL PAPBH - PARADIGM PROFIBUS HOST ADAPTER

- *2 RS232 PORTS (FOR HMI AND PC)*
- *PROVIDES ACCESS TO PROFIBUS NETWORK THRU DB9 CONNECTOR*
- *EASILY CONFIGURED USING EDICT97*
- *BASE OR DIN RAIL (OPTIONAL) MOUNTING*
- *STATUS LEDs*
- *FIELDBUS TYPE : PROFIBUS-DP EN 50 170, IMPLEMENTED USING SIEMENS SPC3 ASIC*
- *AUTOMATIC BAUD RATE DETECTION IN THE RANGE 9.6 KBAUD – 12 MBAUD*
- *STATION ADDRESS IS SET BY PROFIBUS NETWORK DRIVER INSTALLED ON HMI PROGRAMMING PORT*
- *FREEZE MODE AND SYNCH MODE ARE SUPPORTED*
- *CONFIGURATION ALLOWS FOR SINGLE IDENTIFIER AND SPECIAL IDENTIFIER DATA AREA DESCRIPTIONS, WITHOUT DATA CONSISTENCY SUPPORT*

DESCRIPTION

The PAPBH Paradigm PROFIBUS Host Adapter provides a communication channel from a PROFIBUS-DP EN50170 Network to a Paradigm Operator Interface (HMI). The PROFIBUS Network is connected to the PAPBH (Paradigm PROFIBUS Host Adapter) through a 9-pin sub-miniature D-type female connector. The PROFIBUS Network is isolated from the control electronics using high-speed opto-couplers and isolated from the supply with a DC/DC converter. Three LED's provide status information.

The PAPBH can be base mounted (using the 4 holes provided in the base plate) or DIN rail mounted (using the optional DIN rail mounting kit).

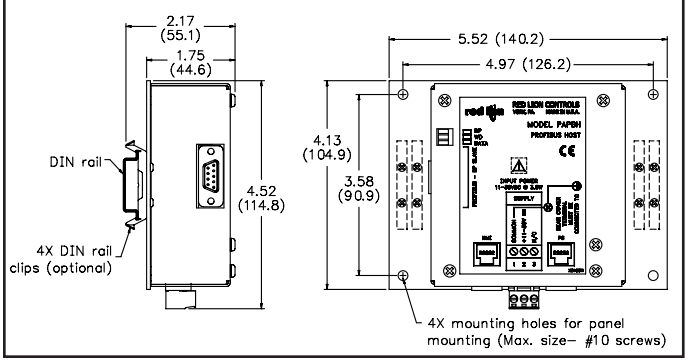
In normal operation the PAPBH is intended to be connected via it's HMI port to the programming port of the HMI. Database download can still be carried out via a connection from the PC to the PC port of the PAPBH. All connections are made using standard Red Lion Controls programming cables. Configuration is by the PROFIBUS Network Driver installed on the HMI programming port.

On power up the PAPBH polls the HMI for its Station Address and configuration. During start up the PROFIBUS master attempts to parameterize and configure the PAPBH. Following start up, data is exchanged between the PAPBH and the HMI.

PNO Conformance and GSD file

The PAPBH has passed the conformance test for PROFIBUS-DP Slave Devices, Certificate No. Z00584. The PNO Identifier for this PROFIBUS device is 0x00FC. The characteristics are described in GSD file PCL00FC.GSD. A disk containing the GSD file and bitmap is included with each PAPBH.

DIMENSIONS In inches (mm)



SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

CAUTION: Read complete instructions prior to installation and operation of the unit.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
PAPBH	PROFIBUS Host Adapter	PAPBH000
—	PAPBH DIN Rail Mounting Kit (Includes 4 clips and 8 screws)	PAPBHDIN
—	Programming Cable	P890301Z

SPECIFICATIONS

1. **POWER REQUIREMENTS**: 11 to 30 VDC @ 3.0 W
   Power Up Current: 3 A @ 2 msec
   Must use a Class 2 or SELV rated power supply.
2. **SERIAL PORTS**:
   PC Port: RS232 on an RJ-11 jack.
   HMI Port: RS232 on an RJ-11 jack.
   ProfiBus Port: RS485 on a DB9 connector
3. **PHYSICAL DIMENSIONS**: L = 5.52" (140.2 mm), W = 4.52" (114.8 mm), H = 1.76" (44.7 mm)
4. **CONSTRUCTION**: Steel base plate and cover. Installation Category I, Pollution Degree 2
5. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature: 0 to 40 °C
   Storage Temperature: -20 to 80 °C
   Operating and Storage Humidity: 80% max. relative humidity (non-condensing) from 0 °C to 40 °C.
   Altitude: Up to 2000 meters

6. **CERTIFICATIONS AND COMPLIANCES**:

SAFETY

IEC 1010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

ELECTROMAGNETIC COMPATIBILITY

Immunity to EN 50082-2

Electrostatic discharge	EN 61000-4-2	Level 2; 4 Kv contact Level 3; 8 Kv air
Electromagnetic RF fields	EN 61000-4-3	Level 3; 10 V/m 80 MHz - 1 GHz
Fast transients (burst)	EN 61000-4-4	Level 4; 2 Kv I/O Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 V/rms [1] 150 KHz - 80 MHz

Emissions to EN 50081-2

RF interference	EN 55011	Enclosure class A Power mains class A

Note:

1. Self-recoverable loss of performance during EMI disturbance at 10 Vrms:
For operation without loss of performance:
Install 1 ferrite core RLC #FCOR0000 or equivalent, to power cable at unit.
I/O cables are routed in metal conduit connected to earth ground.

7. **FIELD CONNECTIONS**: Removable screw terminal blocks.

8. **WEIGHT**: 1.25 lb (0.58 kg)

STATUS LED's

Three LED's provide status indication and are described in Table 1. The PROFIBUS–DP state machine is indicated by the data, WD and DP LED's and are described in Table 2.

Table 1
Paradigm PROFIBUS Host Adapter Status LED Description

NAME	COLOR	FUNCTION
DATA	Red	PROFIBUS-DP Data Exchange state (driven by SPC3 DATA_EX pin)
WD	Green	Watchdog State Machine State
DP	Red	DP Control State Machine State

Table 2
Led Indication of Paradigm PROFIBUS Host Adapter State In PROFIBUS-DP Slave State Machine

DATA LED (Red)	WD LED (Green)	DP LED (Red)	PARADIGM PROFIBUS HOST ADAPTER STATE
OFF	ON	OFF	Baud Search state
OFF	FLASHING	OFF	Baud Control State
OFF	OFF	ON	Waiting for Parameterization Telegram
OFF	OFF	FLASHING	Waiting for Configuration Telegram
ON	OFF	OFF	Data Exchange State

WIRING AND CONNECTIONS

POWER SUPPLY REQUIREMENTS

The Operator Interface requires an 11 to 30 VDC power supply rated at 2.25 W unless otherwise stated on the label.

- The terminal may take as little as 100 mA in certain circumstances, so be sure that the chosen power supply can operate correctly with this load. Large switch-mode supplies tend to need a certain minimum load before they will operate correctly.

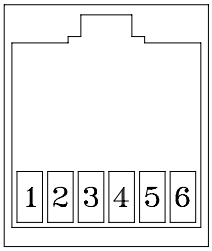
In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. A very high proportion of reported problems are caused by incorrect power supply installation, so please take care to observe the following points...

- The power supply must be mounted close to the unit, with usually not more than 6 feet of cable between the supply and the PAPBH. Ideally, as short a length as is possible should be used.
- The wire used to connect the PAPBH's power supply should be of at least 22 gauge wire. If a longer cable run is used, you should use a heavier gauge wire. The routing of the cable should be kept away from large contactors, inverters and other devices which may generate significant electrical noise.

RS232 PORT PIN OUT

Both HMI and PC ports are RS-232 ports and have the same pin-out described below. The following illustration and table gives the pin-out of these ports to enable such connections to be made.

RJ11 FEMALE	
PIN	NAME
1	RTS
2	Tx
3	GND
4	GND
5	Rx
6	CTS



Rear View of Unit

The above table denotes the pin names of the RS-232 port. When connecting, the pin name at the port is connected to the opposite of that pin name at the destination device.

PROFIBUS CONNECTION

It is recommended that PROFIBUS plug connector such as Siemens part 6ES7 972 – 0BA00 – 0XA0 be used. If the PAPBH is the last unit on the network, set the terminating resistor switch to the "ON" position.

TROUBLESHOOTING

For further technical assistance, contact technical support at the appropriate company numbers listed.

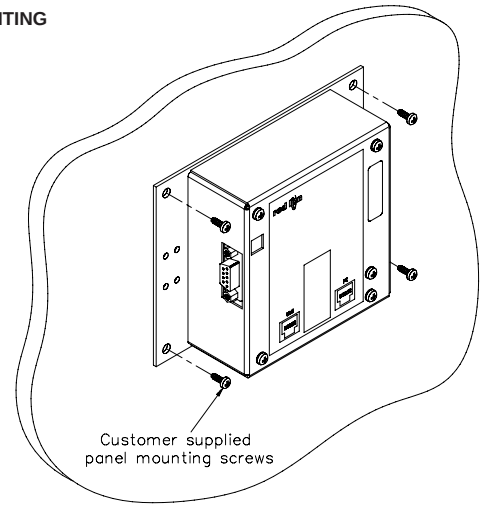
INSTALLATION ENVIRONMENT

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

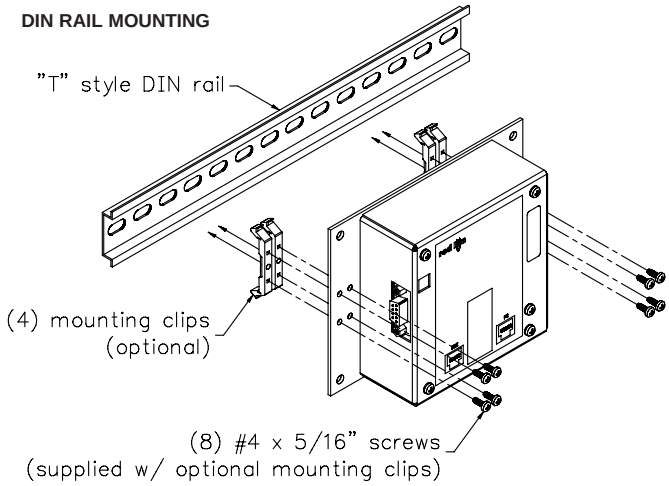
MOUNTING

The PAPBH can be base mounted or installed using the optional DIN rail mounting kit.

PANEL MOUNTING

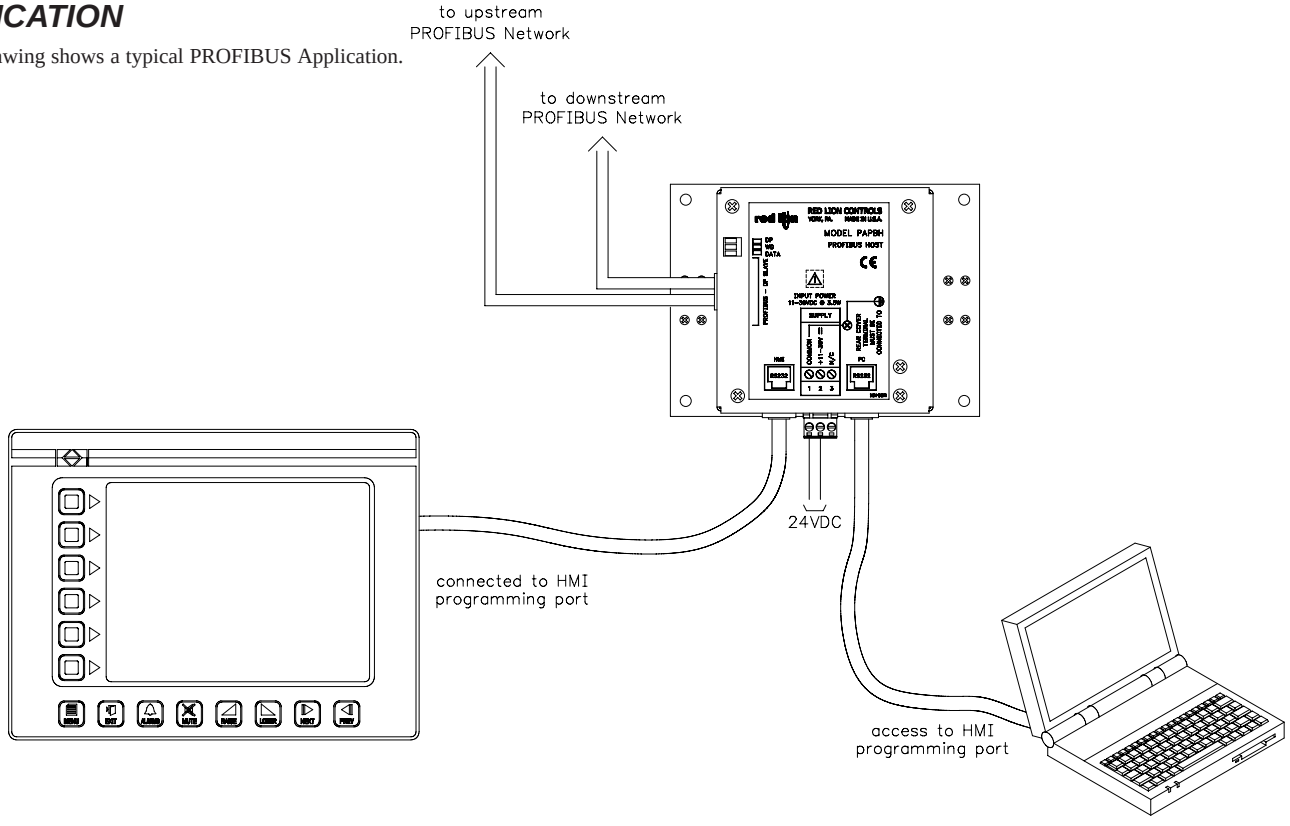


DIN RAIL MOUNTING



APPLICATION

This drawing shows a typical PROFIBUS Application.



PROFIBUS NETWORK DRIVER APPLICATION NOTE

Introduction

The PAPBH is a gateway that allows a Paradigm Operator Interface access to a PROFIBUS-DP Network. The Host Adapter is connected to the Operator Interface programming port allowing data transfer with Internal Communications Blocks. The PAPBH is auto-configuring for all PROFIBUS properties such as baud rate, but needs a Station Address configured by the Operator Interface. These are set up using the PROFIBUS Network Driver described here.

Configuration

The Station Address and Input and Output Data Container Blocks are set in the Configuration Edit dialog from the Select Communications Driver dialog.

The Station Address has a default value of 126 and must be in the range 1 to 125 for normal operation.

The Input and Output Data Container Blocks are the data buffers that the PROFIBUS Network writes data to, and reads data from. These correspond to Internal Communications Blocks and as such these must be set up in the Communications Block Table. A maximum of 116 words may be transferred per block. Data flow is described with respect to the PROFIBUS Network - thus Input Data is written to the PROFIBUS Network and Output Data is read from the PROFIBUS Network.

Example

This example shows the PROFIBUS Node configured as Station Address 5, Communications Block A as Input Data and Communications Block B as Output Data.

Driver Configuration

PROFIBUS DP-SLAVE CONFIGURATION	
Name	Value
Station Address	5
Input Data Container Block	A
Output Data Container Block	B

Communication Block Configuration

COMMUNICATION BLOCKS								
	DEVICE	ADDRESS	DATA TYPE	SIZE	ACCESS	UPDATE	LINKS	ENABLE
A	Internal	None	16-bit Signed	10	Read	Auto	None	Default
B	Internal	None	16-bit Signed	10	Read	Auto	None	Default

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