# СИСТЕМЫ УПРАВЛЕНИЯ

## Руководство пользователя

## на Total Plant Solution

# Introduction

## Overview

The TPS (**TotalPlant** Solution) System Overview document provides a high level description of Honeywell IAC's open automation system intended for use on projects from small to very large. The TPS system is the evolution of the TDC 3000[X] system (now called TPS Network) and includes all the capabilities of that system, as well as many new capabilities. The TPS components, such as the human interface and application platform, are described here, as well as the unified and consistent approach for accessing data and managing system resources.

## Functional Overview

### Scope

The **TotalPlant** Solution (TPS) system is Honeywell's open plant automation system. It includes our robust, secure distributed control capabilities, as well as advanced applications like multivariable control, batch control, and optimization, plant-wide history, and information management capabilities in one unified system. The diagram below illustrates this approach.

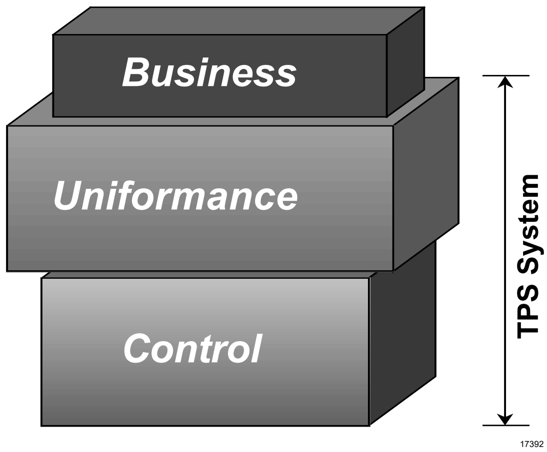


**Figure 1 TPS System**

This document focuses on the components contained within the "Control" portion of the TPS system. These control components comprise the automation platform upon which the information and application software is supported. They include the field devices, human interfaces, application platform support, as well as the system infrastructure that "glues" the system together. Some of the components include:

- Field Measurement Control
  - Transmitters
  - Analyzers
  - Sensors
- Regulatory Control
  - High Performance Process Manager
  - Application Module/Application Nodes

– Global User Station/Universal Station

– History Module/Process History Database

– Fail Safe Controller

This document does **not** cover the information management applications, advanced control applications or Honeywell services, nor does it dwell on TPS system components fully documented in other publications, such as TPS Network or Field Instruments. A description of several Uniformance products can be found in the section entitled Related Products and Applications. While not all Uniformance products are represented there, all are well integrated with TPS Control to complete the TPS system.

### TPS System Components (Control)

The TPS system is designed to meet the needs of large systems while being scaleable to relatively small systems. TPS system key features include the following:

- Openness
- Smart field devices
- State-of-the-art human interface
- Advanced engineering tools
- Real-time database and plant-wide historian
- Open application environment
- Proven robust and secure control environment
- Open interface to enterprise management applications

TPS system's unifying infrastructure pulls these features together into a complete system.

A hardware overview of the TPS system major components is pictured below.

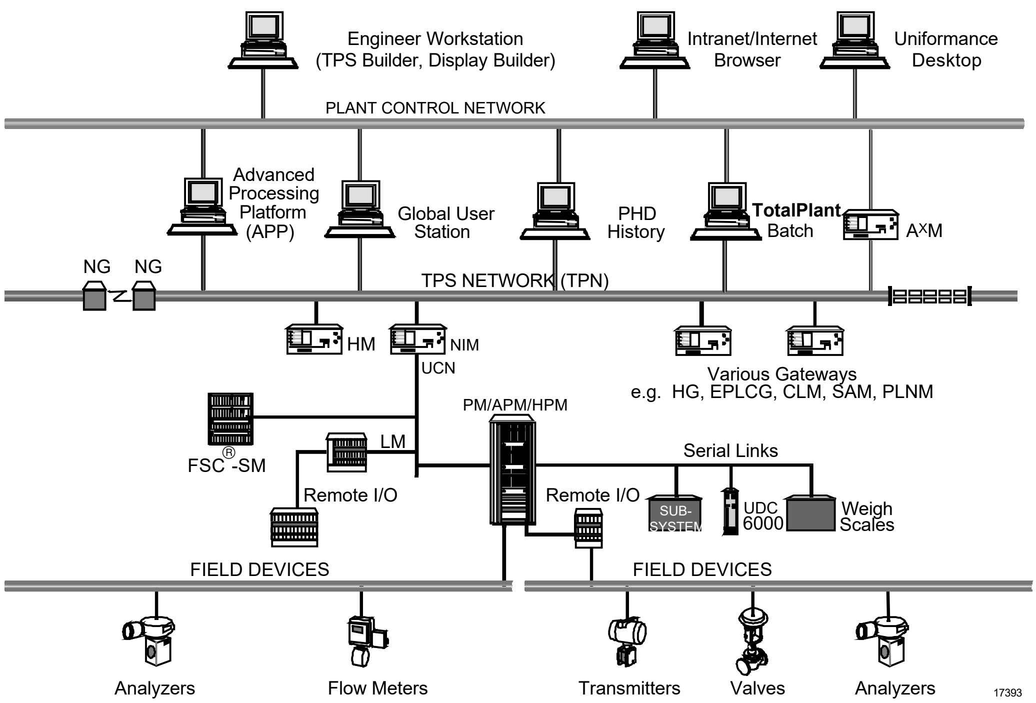


**Figure 2 TPS Hardware Components**

The thrust of the TPS system is an integrated set of components.

- Global User Station (GUS)
- Process History Database (PHD) historian and real-time database
- Application nodes including the Application Processing Platform (APP)
- TPS Builder
- TPS Network (TPN)
- Smart field devices
- Unifying TPS Infrastructure

The software architecture is pictured below, and is followed by a description of each of the major components.

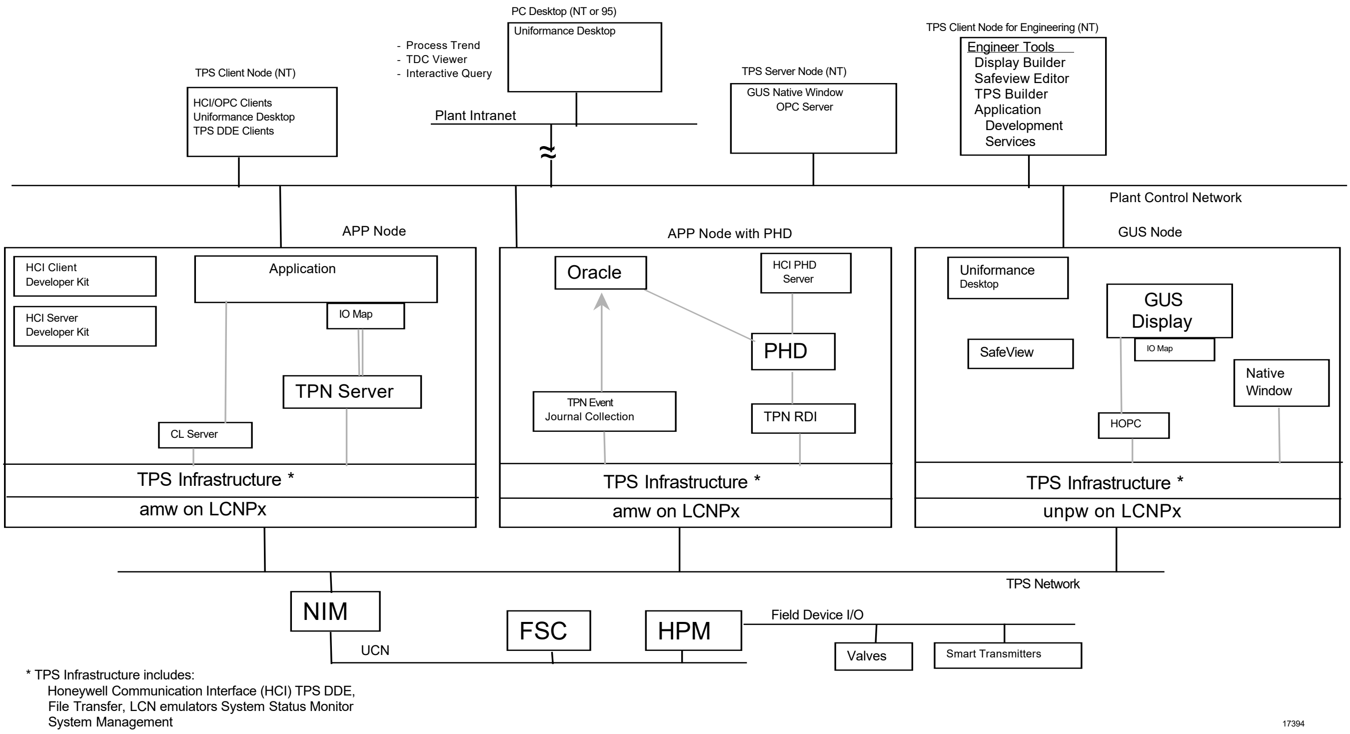


**Figure 3 TPS Software Components**

***TPS Node***

A TPS node is a commercial Intel-based workstation running Microsoft's Windows NT operating system. It contains TPS system software and belongs to a TPS Domain. It has a connection to the Plant Control Network (PCN) and can optionally have a connection to the TPS Network (TPN). The functions that a TPS node performs depend on the combination of TPS system software loaded (e.g., operator interaction or application processing). A TPS node is defined as any of the following.

- GUS
- APP
- Client or Server Node

### *Global User Station (GUS)*

GUS is a TPS node that has a connection to the TPS Network (TPN) through an LCNP or LCNP4 card and runs a US (unpw) personality. It is packaged in a Console or Deskside configuration. It is a state-of-the-art human interface and consists of a Native Window, Display Runtime, and SafeView. The Native Window provides all original TPN Universal Station operating and engineering displays in a window on the Global User Station. The Display Runtime component executes GUS displays built by the Display Builder or translated from TPN schematics by the Display Translator. SafeView is a window manager that allows a user to define where types of windows can appear, move to, resize or overlap other windows. SafeView can be configured to ensure that critical windows are never hidden.

GUS is intended for use by operators and engineers to monitor and control the process, Honeywell TPS components, and applications. GUS provides historical trending from the TPN History Module or from PHD. GUS displays can also get named data from a PHD data source or another TPN using HCI named data access rather than the local connection to the TPN, known as HOPC. This helps keep the local TPN loading to a minimum.

### *Application Processing Platform (APP)*

The APP is a TPS node that has a connection to the TPS Network through an LCNP4 card and runs either an AM or AMw personality. It is packaged in either a deskside or desktop configuration. The APP is a state-of-the-art application platform for integrating advanced control or information management applications. It can communicate directly with an existing TPS Network.

The APP contains the TPS system Infrastructure component for communicating to TPN and to HCI/OPC client and server applications in TPS Client and TPS Server nodes. It also contains other functions such as TPS Status Display, TPS Configuration, File Transfer and TPSDDE. The CL Server leverages existing Application Module (AM) applications by allowing them to initiate applications that reside in the Windows NT environment.

Applications may also be built using the IOMap interface to connect to HCI/OPC servers. This interface provides the ability to write generic applications through tag name aliases and to gather data from multiple data sources in a single call.

### *TPS Client or Server Node*

A TPS client or server node is an off the shelf workstation purchased outside of Honeywell and is connected to the PCN. It does not have a TPS Network connection, but can host TPS client applications, or TPS server applications, or both. Client applications that can run on the APP can also run here, although they need to connect to an APP to get TPN data. Server applications would include any HCI/OPC server of data (see TPS System Infrastructure for more on this). In addition, it can host Engineering software such as GUS Display Builder or TPS Builder.

### *TPS Builder*

TPS Builder is a graphical engineering tool for building control strategies and configuring process control data on a TPS system.

It includes the following.

- Easy-to-use graphical user-interface
- Provision for building and use of templates
- Simultaneous creation of the control drawing while creating the control strategy
- Ability to share data and work with other applications
- Other advanced capabilities

TPS Builder supports the following capabilities.

- Configuration
- Documentation
- Database reporting
- Control Language (CL) programming support
- Control strategy drawing

### *Process History Database*

PHD is a plant-wide, high-performance historian. It can collect data from any TPS data source including the TPS Network and non-TPS systems. PHD provides data imaging of these systems, including calculated and user-defined auxiliary values. PHD also provides access to non-TPS devices for any TPS component or application. PHD allows the supervisory portion of TPS to be independent of the data source. Application data may also be contained within PHD and can be used by applications to share information. For example, GUS can display or alter application data and PHD can historize it.

PHD is currently configured by its own builder in TPS; however, over time its configuration will be integrated within the TPS Builder.

### *Desktop Tools*

The desktop tools are referred to as the Uniformance Desktop. These tools are used by engineers and management to do the following:

- Monitor the process
- Troubleshoot
- Perform analysis and reporting functions

The desktop provides a trend/analysis tool for the desktop, Excel-based report generator, scheduler, and graphic viewer. These tools are designed to work with PHD data and other data sources.

### *TPS System Infrastructure*

The system infrastructure pulls the system together. It provides secure communication between the major TPS components, and allows these components to be physically distributed across TPS nodes. The data access function of the infrastructure provides access to TPS Network data for TPS components and applications. The following are the main components of the infrastructure.

- **OPC** – OLE for Process Control Interfaces
- **HCI** - Honeywell Communications Interfaces, utilizing Microsoft's DCOM technology and OPC
- **HCI Client and Server Toolkits**
- **HCI TPN Server** - Data access server for TPN data
- **TPSDDE** – TPN data read capability through Microsoft's Dynamic Data Exchange mechanism
- **File Transfer** - capability to transfer files between the HM and the Windows NT file system
- **System Status Monitor** - monitors status of TPS nodes and components
- **System Management** - startup, shutdown, backup, restore, security, configuration, and replication

The communication infrastructure provides a set of interfaces that includes the data access mechanisms as defined by the OPC standards committee, as well as enhancements such as prioritized requests, timed requests and status information. The **HCI TPN Server** provides the link between applications and TPS Network data. It is an OPC server that also recognizes HCI value added interfaces. Thus, it can serve data to applications that use OPC-only and those that use HCI/OPC interfaces.

− Provides the I/O interface to field devices

For more information on the TPS Network, refer to the *System Overview* (SW70-500).

### *Field Devices*

Process data like pressure, temperature and flow, is collected and transmitted by field instruments to process-connected controllers. TPS system includes a complete portfolio of smart transmitters that span a wide performance range and can provide the basis for process control in any system. Smartline products have set the standard for quality, reliability, accuracy, and can be digitally integrated to the Honeywell automation system.

These products and solutions are divided into the following three areas.

- **Analytical** Instruments - proprietary sensor technology applicable to a broad portfolio of liquid and gas measurements, as well as particle and components measurements.
- **Control Products** - process control instrumentation for meeting the needs of a variety of industries. These include the LeaderLine family of controllers, programmers, and recorders. The LeaderLine Controllers are used to control temperature, level, pressure, furnace atmosphere, and relative humidity. TPS system integration capability provides remote control functions with operator functions fully accessible at the Global User Station.
- **Field Instruments** - robust process measurement solutions for pressure, temperature, level, and flow using Honeywell's Smartline field instruments. These instruments provide bidirectional digital communication between transmitter and controller or Field Communicator and can be digitally integrated with the TPS system automation systems to minimize project implementation, downtime, and maintenance costs. A range of output communication options is available, which include standard 4-20 mA, Digital Enhanced (DE), HART, and Foundation Fieldbus.

По вопросам продаж и поддержки обращайтесь:

**Алматы** (7273)495-231
**Ангарск** (3955)60-70-56
**Архангельск** (8182)63-90-72
**Астрахань** (8512)99-46-04
**Барнаул** (3852)73-04-60
**Белгород** (4722)40-23-64
**Благовещенск** (4162)22-76-07
**Брянск** (4832)59-03-52
**Владивосток** (423)249-28-31
**Владикавказ** (8672)28-90-48
**Владимир** (4922)49-43-18
**Волгоград** (844)278-03-48
**Вологда** (8172)26-41-59
**Воронеж** (473)204-51-73
**Екатеринбург** (343)384-55-89
**Иваново** (4932)77-34-06
**Ижевск** (3412)26-03-58
**Иркутск** (395)279-98-46
**Казань** (843)206-01-48
**Калининград** (4012)72-03-81
**Калуга** (4842)92-23-67
**Кемерово** (3842)65-04-62
**Киров** (8332)68-02-04
**Коломна** (4966)23-41-49
**Кострома** (4942)77-07-48
**Краснодар** (861)203-40-90
**Красноярск** (391)204-63-61
**Курган** (3522)50-90-47
**Курск** (4712)77-13-04
**Липецк** (4742)52-20-81
**Магнитогорск** (3519)55-03-13
**Москва** (495)268-04-70
**Мурманск** (8152)59-64-93
**Набережные Челны** (8552)20-53-41
**Нижний Новгород** (831)429-08-12
**Новокузнецк** (3843)20-46-81
**Новосибирск** (383)227-86-73
**Ноябрьск**(3496)41-32-12
**Омск** (3812)21-46-40
**Орел** (4862)44-53-42
**Оренбург** (3532)37-68-04
**Пенза** (8412)22-31-16
**Пермь** (342)205-81-47
**Петрозаводск** (8142)55-98-37
**Псков** (8112)59-10-37
**Ростов-на-Дону** (863)308-18-15
**Рязань** (4912)46-61-64
**Самара** (846)206-03-16
**Санкт-Петербург (**812)309-46-40
**Саранск** (8342)22-96-24
**Саратов** (845)249-38-78
**Севастополь** (8692)22-31-93
**Симферополь** (3652)67-13-56
**Смоленск** (4812)29-41-54
**Сочи** (862)225-72-31
**Ставрополь** (8652)20-65-13
**Сургут** (3462)77-98-35
**Сыктывкар** (8212)25-95-17
**Тамбов** (4752)50-40-97
**Тверь** (4822)63-31-35
**Тольятти** (8482)63-91-07
**Томск** (3822)98-41-53
**Тула** (4872)33-79-87
**Тюмень** (3452)66-21-18
**Улан-Удэ** (3012)59-97-51
**Ульяновск** (8422)24-23-59
**Уфа** (347)229-48-12
**Хабаровск** (4212)92-98-04
**Чебоксары** (8352)28-53-07
**Челябинск** (351)202-03-61
**Череповец** (8202)49-02-64
**Чита** (3022)38-34-83
**Якутск** (4112)23-90-97
**Ярославль** (4852)69-52-93

**Россия** +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

**сайт: www.honeywell.nt-rt.ru || эл. почта: hwn@nt-rt.ru**