SIMATIC HMI Overview

The Human Machine Interface
SIMATIC HMI Overview

Introduction
- Operator Devices
- Multifunctional Platforms
- WinAC MP
- THIN CLIENT
- PC Platforms
- Flat Panel Monitors
- HMI Software
- Customized Products
- All about SIMATIC HMI
Making the increasingly complex easier

- The processes become more and more multi-layered ...
- The functionality of machines and systems grows ...
- In the middle of this stress field stands the operator. He/She has a lot to monitor and control.

- What the operator needs is a maximum of transparency, a Human Machine Interface (HMI).
- Controlling and monitoring with SIMATIC HMI means
  - ... to be in command of the process
  - ... to keep machines and systems running
  - ... availability and productivity
Control and Monitoring Systems
SIMATIC HMI

Complete and innovative Product Spectrum for all Industries
- From operator device up to process visualization system
- Customized solutions possible

Open
- Can be freely combined in the automation world
- Can be integrated into the company-wide IT landscape

Part of Totally Integrated Automation
- Minimum engineering costs at maximum productivity

Everything from a single Source
- Hardware, software, service and more
The entire world of human machine interfacing: SIMATIC HMI

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Enterprise Resource Planning (ERP)
Manufacturing Execution Systems (MES)
Plant Intelligence

Process visualization

Single-user PC
Client/Server
Internet Client
SCADA-System WinCC

Machine-level Human Machine Interface
- Push Button Panels
- Micro Panels
- Mobile Panels
- Panels
- Multi Panels
- THIN CLIENT
- Panel PCs
- HMI-Software WinCC flexible

SIMOTION Motion Control
SIMATIC Controllers
Other automation systems
Optimally equipped for the Integration into the Automation and Enterprise Levels

**Open, standardized interfaces for simple integration:**

- Microsoft Windows XP/Windows XP embedded
- Microsoft Windows CE
- Microsoft SQL Server 2005
- Microsoft Visual Basic
- Microsoft ActiveX
- ANSI-C
- PROFINET/Ethernet
- PROFIBUS
- VB Script
- OPC (Ole for Process Control)

**Connectable to many Automation Systems**

- SIMATIC and SIMOTION
- PLCs of other manufacturers
Worldwide Application

Multilingual Configuration and Visualization Software

- German, English, French, Spanish, Italian as well as asian character languages for China, Taiwan, Korea and Japan
- Simple language switch during the configuration
- Implementation of a project for multiple runtime target languages
- Many online languages and fonts available
- Online language switch directly at the operator device
Integrated into the World Wide Web

**SCADA System WinCC turns the Web into a Control Room**

For the visualization and operation via Internet and Intranet

Within a plant or in a global network

Utilization of rugged THIN CLIENT

Application of mobile devices:

- HPCs and PDAs for current management data
- Web Pad Mobic for service personnel
Increased Plant Availability

**Rugged construction of all Operator Devices**
- For rough industrial application

**Redundant process visualizierung System WinCC**
- For the highest operational availability

**Process diagnostics ProAgent for Localizing and correcting malfunctions**
- For reduced downtimes

**Service and diagnostics via Web**
- Automatic e-mail notification in case of malfunctions
- Remote diagnostics and control to quickly detect errors

**Plant Intelligence with DowntimeMonitor, ProcessMonitor and DataMonitor for more transparency and increased availability.**

**Maintenance Station for intelligent preventive maintenance.**
Thanks to Totally Integrated Automation (TIA), Siemens is the only provider of an integrated basis for implementation of customized automation solutions – in all industries from inbound to outbound.

TIA is characterized by its unique continuity. It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system.

This reduces the complexity of the automation solution, for example in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities for increasing the availability of your plant.
All Benefits of Totally Integrated Automation

WinCC flexible integrated into the SIMATIC Manager
- HMI projects are managed directly in the S7 project

Common Data Management of WinCC flexible and STEP 7
- Direct access to the symbol list and communication parameters saves multiple entries

Matched Process Error Diagnostics with WinCC flexible, ProAgent and S7-PDIAG/S7-GRAPH/S7-HiGraph
- No HMI configuration work through standard diagnostics pictures
- Automatic generation of all ProAgent picture contents
All Benefits of Totally Integrated Automation

Common Data Management of WinCC and STEP 7
- Tag and message lists are entered once and then maintained centrally
- Multiple entries are avoided

Optimized System Diagnostics with WinCC
- Fast, guided diagnostics in the STEP 7 program
- Start of the STEP 7 hardware diagnostics

Matched Process Error Diagnostics with WinCC, ProAgent and S7-PDIAG/S7-GRAPH
- No WinCC diagnostics configuration
- Automatic generation of all ProAgent picture contents

Option Maintenance Station for intelligent preventive maintenance
SIMATIC HMI Overview

- Introduction
- Operator Devices
  - Multifunctional Platforms
  - WinAC MP
  - THIN CLIENT
- PC Platforms
- Flat Panel Monitors
- HMI Software
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Unique Spectrum of Operator Devices for the most varied Requirements

Connect and use right away: 
Pushbutton Control Panels

Everything in View: 
Bright Displays
- Text-based or fully graphical
- Monochrome STN or color TFT
- From 3” to 19”

Ease of Use:
Ergonomic membrane keyboard or intuitive touchscreen

Highest Flexibility:
Stationary or mobile
First Choice for Use at the Machine-level

- **Rugged, compact and versatile**
- Optimally suited for use in rough industrial environments
- Shallow mounting depth of stationary devices
- Mobile Panels permit flexible application at different locations

**Open for different Automation Systems**
- Different PLCs can be connected
- All interface onboard
- PROFINET IO-capable

**One Configuration Software for all Operator Devices:**
SIMATIC WinCC flexible
HMI Devices
**Product Classes**

### Introduction

### Operator Devices

### Multifunctional Platforms

### WinAC MP

### THIN CLIENT

### PC Platforms

### Flat Panel Monitors

### HMI Software

### Customized Products

### All about SIMATIC HMI

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**Push Button Panels**
Bus-capable button control panels
Pre-configured and ready-to-install

**Micro Panels**
Text Displays (TD), Operator Panels (OP) and Touch Panels (TP) specifically for the S7-200

**Mobile Panels**
Mobile operator devices for the direct system and machine operation from any location, also wireless, with full safety function

**Panels**
Many levels of performance and convenience are available
As Text Display, Operator Panel or Touch Panel
Rugged, compact and versatile

**Multi Panels**
Operator devices with touchscreen or membrane keyboard
High performance, openness and expandability
Integration of multiple automation tasks on the MP

**THIN CLIENT**
Rugged terminals for easy, cost-effective operator control and monitoring

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Standard Interfaces
provide Flexibility and Openness

- Multimedia Card Slot
  Usable for recipe data records and for backing up the configuration and system data

- CF/PC Card Slot
  Easy data exchange with standard memory cards for recipe data, archives or backup/restore functionality
  Expansion by additional interfaces

- USB Port
  Connect keyboard, mouse, printer or barcode reader in runtime

- Standard Windows Storage Format (CSV)
- Process recipe/archive data with standard tools (e.g. Excel)
- Visual Basic Scripts and customized ActiveX Controls for your own function expansion

- Ethernet (TCP/IP)
  Storage of recipes, archives on a central PC
  Download/upload of configuration and firmware for central project management
  Backup/restore functionality
Mobile Panels
HMI becomes mobile

- Proven Safety Concept
  With two acknowledgement pushbuttons and optional STOP pushbutton
- Reliable Operation
  Touchscreen and keyboard
- Rugged Construction
  IP65 degree of protection all-around
  Extremely resistant to shocks
- Ergonomic and compact
  Light-weight
- Via PROFIBUS or PROFINET

Mobile Panels with cable:
- Easy plugging/unplugging in Runtime
  For flexible Use
  With connection point detection
- Patented Connection Technology
  Plugging/unplugging with the connection box Plus does not interrupt the emergency-shutdown circuit
Mobile Panels
Mobile, wireless HMI – Safety Integrated

Wireless Mobile Panels:

Failsafe Operating and monitoring
-TÜV / BGIA certified according to SIL 3
-HMI authorization for individual operators or places / spots
-Identification and distance measurement by transponder technology
-Safety function (acknowledge button, emergency-stop) viaPROFISAFE
-Safety-related operating elements (acknowledge button, emergency-stop)

Increased availability
-Flexible changing of batteries for continuous operation without interruption
-Support of Sm@rt Access und Sm@rt service for flexible plant concepts
-SD-/Multi Media Card Combi Slot for fast data transmission
## SIMATIC HMI Overview

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Operator Devices</th>
<th>Multifunctional Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>WinAC MP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>THIN CLIENT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC Platforms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flat Panel Monitors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HMI Software</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customized Products</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All about SIMATIC HMI</td>
</tr>
</tbody>
</table>
SIMATIC Multi Panels
More than just Control and Monitoring

- Bright TFT display with up to 64k colors
- 6" / 8" / 10" / 12" / 15"
- Large memory capacity, additional memory expansion possible via card slots, e.g. for archives or recipes, backup/restore functionality
- Also with Multi Media functionality (Viewer for Acrobat-, Excel-, Word-documents, Media Player, Internet Explorer)
- Optimized for control tasks with Software-PLC WinAC MP 2007
- Onboard interfaces
  - PROFINET/Ethernet, PROFIBUS- MPI- und USB
- Modularly expandable with options, e.g.
  - OPC Server for manufacturer-spanning communication
  - Sm@rtService for remote maintenance and service via Intranet/Internet
  - Sm@rtAccess for the entry into the client-server functionality
  - ProAgent for the visualization of process diagnostics alarms
  - Audit for traceability and easy validation
SIMATIC HMI Overview

- Introduction
- Operator Devices
- Multifunctional Platforms
- WinAC MP
- THIN CLIENT
- PC Platforms
- Flat Panel Monitors
- HMI Software
- Customized Products
- All about SIMATIC HMI
**SIMATIC WinAC MP 2007**

*Software-SPS auf Multi Panels*

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**SPS and HMI performance optimally coordinated**

- Cost saving through visualizing and controlling of small and medium applications on one hardware platform
- Remanent data saving, i.e. data, which was declared as remanent in projecting in STEP 7, is still available after voltage drop
- Routing functionality
- Excellent service concept for all data on storage media (incl. licenses, HMI, SPS)
- Password security for SPS controlling possible
- All HMI and SPS data from the panel can simply saved at the touch of a button as backup on an external standard storage medium (MMCard, SD-Card, USB-Stick).

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**Visualizing** + **Controlling** = **Embedded Automation**
SIMATIC HMI Overview

Introduction
Operator Devices
Multifunctional Platforms
WinAC MP
THIN CLIENT
PC Platforms
Flat Panel Monitors
HMI Software
Customized Products
All about SIMATIC HMI
SIMATIC THIN CLIENT
Robuste, wirtschaftliche Bedienterminals

Using as terminals for data visualizing and data input
Perfect for applications with more than one controlling terminal
Safety class IP 54, extensible to IP 65
10“ and 15“ TFT display with touch functionality and 64K colors
Central data saving and administration
  ▶ Closed, secured system independent from user software
  ▶ Easy commissioning „Plug & Play“
  ▶ USB and PROFINET/Ethernet device
  ▶ Contains Sm@rt Access, RDP Client and web browser
  ▶ Operation with Sm@rt Access, terminal or web connection
Implementing innovative Concepts:
SIMATIC Panel PCs

- Compact, rugged and maintenance-free
  - SIMATIC Panel PC 477B embedded

- Industrial functionality at an attractive price
  - SIMATIC Panel PC 577

- Highest performance for hard industrial use
  - SIMATIC Panel PC 677B –
    Compact with high availability

- Highest flexibility through many application possibilities
  - Swivel arm mount
  - Directly at the machine
  - Control panel or cabinet installation
SIMATIC Panel PCs
for all Visualization Tasks

**Integrated Front Panel**
- 12“, 15“, 17“ and 19“ with touch screen
- 12“ and 15“ with membrane keyboard

**Rugged Construction**
- Front meets IP65/NEMA 4 degree of protection
- Vibration loads up to 1g*
- Shock loads up to 5g*
- Increased temperature range up to 45/50° C (at max. configuration)

**Scalable increase of the system availability through expansion components**
- Monitoring and diagnostics functions DiagMonitor
- Preventive data backup (Image & Partition Creator)*
- 2nd Hard drive for backup*
- RAID1 mirrored-drives technology for the highest data protection*

**Also in remote Configuration:**
- Front panel can be placed up to 30 m away (Panel PC 677B)

*except Panel PC 577: Shock 1g/Vibration 0,25g
# SIMATIC Panel PCs and Flat Panel Monitors Portfolio

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Operator Devices</th>
<th>Multifunctional Platforms</th>
<th>WinAC MP</th>
<th>THIN CLIENT</th>
<th>PC Platforms</th>
<th>Flat Panel Monitors</th>
<th>HMI Software</th>
<th>Customized Products</th>
<th>All about SIMATIC HMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Key

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<thead>
<tr>
<th>12“</th>
<th>15“</th>
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<tr>
<th>12“</th>
<th>15“</th>
<th>17“</th>
<th>19“</th>
</tr>
</thead>
</table>

### Panel PC 477B

![Panel PC 477B](image1)

### Panel PC 577

![Panel PC 577](image2)

### Panel PC 677B

![Panel PC 677B](image3)

### Flat Panel Monitors

- **12”**
- **15”**
- **19”**
- **17”**

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SIMATIC Panel PCs
Basis for PC-based Automation

SIMATIC Panel PC as ideal Automation Platform
§ for HMI, Controlling/Regulating or Motion Control

SIMATIC WinAC  
SIMATIC WinCC oder WinCC flexible  
SIMATIC Panel PC

SIMATIC Panel PC 577/677B as Package
with system-tested Software an price advantages
§ SIMATIC WinCC flexible (Visualization at the Machine)
§ SIMATIC WinCC (Process Visualization System)

Embedded Automation with SIMATIC Panel PC 477 –
Low-priced and ready-to-run
§ SIMATIC WinCC flexible (HMI)
§ SIMATIC WinCC flexible (HMI) + WinAC RTX (Software PLC)
The Embedded Automation products are combinations of hardware and software, preinstalled Ready-to-Use
- Rugged and maintenance-free
- Compact and space-saving
- Open and flexible

SIMATIC Panel PC 477-HMI
- with Runtime-Software SIMATIC WinCC flexible
- optionally 128, 512, 2048 Power Tags
- including archives und recipes

SIMATIC Panel PC 477-HMI/RTX
- as Panel PC 477-HMI additional with SIMATIC WinAC RTX
- Software PLC with real-time and deterministic capability

Perfectly combines the ruggedness of an embedded platform with the openness of a PC
<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator Devices</td>
</tr>
<tr>
<td>Multifunctional Platforms</td>
</tr>
<tr>
<td>WinAC MP</td>
</tr>
<tr>
<td>THIN CLIENT</td>
</tr>
<tr>
<td>PC Platforms</td>
</tr>
<tr>
<td><strong>Flat Panel Monitors</strong></td>
</tr>
<tr>
<td>HMI Software</td>
</tr>
<tr>
<td>Customized Products</td>
</tr>
<tr>
<td>All about SIMATIC HMI</td>
</tr>
</tbody>
</table>
SIMATIC Flat Panel Monitors

Bright, rugged Displays for an attractive Price

- Meets all industrial requirements
- Screen diagonals of 12”, 15”, 17” and 19”, available as pure display or touchscreen device
- MTBF of display >= 50,000 h
- Wide viewing angle
- Flexible and future-proof through analog VGA and digital DVI-D interfaces
- Can be positioned up to 30 m away from the computing unit
- Front dimensions and installation cut-outs as Panel PC
# SIMATIC HMI Overview

<table>
<thead>
<tr>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
</tr>
<tr>
<td>Operator Devices</td>
</tr>
<tr>
<td>Multifunctional Platforms</td>
</tr>
<tr>
<td>WinAC MP</td>
</tr>
<tr>
<td>THIN CLIENT</td>
</tr>
<tr>
<td>PC Platforms</td>
</tr>
<tr>
<td>Flat Panel Monitors</td>
</tr>
<tr>
<td><strong>HMI Software</strong></td>
</tr>
<tr>
<td>Customized Products</td>
</tr>
<tr>
<td>All about SIMATIC HMI</td>
</tr>
</tbody>
</table>
SIMATIC HMI Overview
Slide 35/62

SIMATIC HMI
Visualization Software for any Task

**Machine-oriented HMI software:**

- **SIMATIC WinCC flexible**
  - Flexible in application, with one engineering software from Micro Panel up to PC
  - Highest configuration efficiency
  - Innovative HMI concepts
  - Service and diagnostics via the Web
  - Traceability and simple validation

**Process visualization with Plant Intelligence:**

- **SIMATIC WinCC**
  - Scalable from single-user up to distributed multi-user systems with redundant servers and Web clients
  - Open standards for easy integration
    (incl. integrated MS SQL Server)
  - Expandable through options and add-ons

**Multilingual incl. Asian symbol languages**
SIMATIC WinCC flexible
Machine-oriented HMI Software

- Flexible in application
- Highest configuration efficiency
- Innovative HMI concepts
- Service & diagnostics via the Web
- Traceability, simple validation
- Future-proof & protection of investment
SIMATIC WinCC flexible
Engineering Software & Target Systems

Introduction
Operator Devices
Multifunctional Platforms
WinAC MP
THIN CLIENT
PC Platforms
Flat Panel Monitors

HMI Software
Customized Products
All about SIMATIC HMI

Engineering (ES)
WinCC flexible Advanced
WinCC flexible Standard
WinCC flexible Compact
WinCC flexible Micro

Runtime (RT)
SIMATIC Micro Panels
SIMATIC Panels and Mobile Panels 70/170 Series
SIMATIC Panels and Multi Panels 270/370 Series
PC-based WinCC flexible Runtime
**SIMATIC WinCC flexible**
Highest Configuration Efficiency

**Engineering software:**
- Can be switched among 9 languages, incl. 4 Asia languages
- Convenient user interface
- Libraries with ready-made objects and reusable faceplates

**Intelligent tools:**
- Project wizard for creating projects
- Graphical configuration of a screen hierarchy
- Graphical configuration of motion paths
- Quick configuration of mass data
- Support of multilingual configurations via automated text translation
SIMATIC WinCC flexible
Innovative HMI Concepts

**Sm@rtAccess - Communication between operator stations**

- Operator stations with system-wide access to current process values and screens
- Distributed operator stations for the control of large, distant machines
- Local control room solutions with central archiving, analysis and further processing of process data
- Connection to Office applications
**Sm@rtService - for Web-based service concepts**

- Event-driven sending of e-mails and SMS messages to the service personnel
- Remote control of onsite stations via the Intranet/Internet
- Operator station diagnostics via ready-made diagnostics functions and screens
- Service and maintenance functions
  - Download of projects
  - Download/upload of recipes
SIMATIC WinCC flexible
Traceable and can be validated easily

**Basic System**
- Local user administration and access control

**Audit**
- Convenient configuration of the GMP-relevant functions (Good Manufacturing Practice)
- Electronic signature
- Logging of the operator actions in audit trails
- Simplified compliance with legal regulations according to EU 178/2002 and 21 CFR Part 11
- For PCs, Panels and Multi Panels of the 270 series or higher

**Change Control**
- Versioning and change tracking of projects
- Validation support

**Ready for Validation**
- Engineering/Control Room
- Long-term Archiving
- Machine 1
- Machine 2

Cost-effective Panel solutions for FDA-compliant systems in the pharmaceutical industry, ideal for the supply of machines
SIMATIC WinCC flexible
Future-proof and Protection of Investment

Taking over projects from ProTool family (V5.2 and above) for:
- Windows-based Panels
- PCs with ProTool/Pro

Conversion of ProTool projects for text/graphics panels
SIMATIC ProAgent
Efficient Process Diagnostics

Option Package for Panels, Multi Panels and WinCC flexible Runtime

- Quick information about error cause, error correction directions
- Convenient diagnostics display and operating options
- Transfer of the diagnostics data generated by the engineering tools S7-PDIAG, S7-GRAPH and S7-HiGraph
- Tailored to the SIMATIC S7-300/S7-400

Reduce Downtimes, increase Plant Availability
SIMATIC WinCC
The Process Visualization System

Can be used universally
- Solutions for all industries
- Multilingual for worldwide application
- Can be integrated into all automation solutions

All HMI Functions onboard

Simple and efficient Configuration

Continuously Scalable
- From single-user up to multi-user system
- Redundant, distributed and Web solutions

Open Standards for Ease of Integration
Integrated Historian as Information Broker
More Transparency by Plant Intelligence
Extendable via Options and Add-Ons
Extendable by Maintenance Station
SIMATIC WinCC
All HMI Functions onboard

Introduction
Operator Devices
Multifunctional Platforms
WinAC MP
THIN CLIENT
PC Platforms
Flat Panel Monitors
HMI Software
Customized Products
All about SIMATIC HMI

SIMATIC HMI Overview
Slide 45/62

Industry Sector
**SIMATIC WinCC**

**Continuously scalable**

- ... from Single-User System to Server
- ... if required, with (Thin) Clients on the Web
- ... from Archiving to separate Historian
- ... Redundancy if desired (Server, Communication)
SIMATIC WinCC
Open Standards for Ease of Integration

- Microsoft Windows XP/Windows XP embedded
- Microsoft Windows Server
- Microsoft Visual Basic
- Microsoft SQL Server 2005
- Active X
- WinCC OLE-DB
- OPC (OLE für Process Control)
  - OPC Data Access
  - OPC eXtended Markup Lanuage
  - OPC Historical Data Access
  - OPC Alarm & Events
- VB Script
- ANSI-C
SIMATIC WinCC
Integrated Historian as a Information Broker

... HMI, Analysis & Evaluation with WinCC
or any other Computer

Long-Term Archiving
Data Compression
Swapping & Backup
SIMATIC WinCC
More Transparency by Plant Intelligence
**SIMATIC WinCC**

Expandable via Options and Add-Ons

**Scalable System Configurations**
- WinCC/Server - Multi-User Solutions
- WinCC/Web Navigator - HMI via the Web

**Increase of the Availability**
- WinCC/Redundancy - Redundant Systems
- WinCC/ProAgent - Process Diagnostics

**Plant Intelligence, e.g. with:**
- WinCC/Dat@Monitor – Datenanalyse
- WinCC ProcessMonitor – Key Performance Indicators (KPI)
- WinCC DowntimeMonitor – Downtime-Analyse
- WinCC/Connectivity Pack
- WinCC/IndustrialDataBridge

**SCADA Expansions**
- WinCC/User Archives - User Data

**System Expansions**
- WinCC/IndustrialX - ActiveX Config.
- WinCC/ODK - Open Development Kit

**Maintenance Station for intelligent preventive maintenance**
SIMATIC WinCC
Expandable through Options and Add-Ons

Central, system-wide **user administration** via SIMATIC Logon, integrated into the Windows user management.

Quick and convenient setup of audit trails via WinCC/Audit.

Reliable monitoring of operator actions and configuration changes in **audit trails**.

Reduced engineering work for complying with 21 CFR Part 11 (pharmaceuticals) and EU178/2002 (F&B) regarding **traceability**.

**Ready for Validation**

U.S. Department of Health and Human Services
Food and Drug Administration
SIMATIC Maintenance Station
Effiziente Instandhaltung mit WinCC

Visualization of the maintenance information of the entire automation system

- Automatic derivation of the data from the hardware configurations
- SCADA-System and Maintenance Station run on a common computer
- Traceability of events and operator actions via automated alarms, which form the basis for later analyses to optimize the plant
- Optimal resource planning via an overview of all upcoming maintenance jobs
- Manufacturer-spanning display of service and maintenance data
Tailored to your Requirements: Customized Products

Fit into any Environment: SIMATIC HMI Designer Devices

- Changes to
  - Frame Color
  - Keyboard Color
  - Key Labeling and Key Symbols
  - Type Designation, Company Logo

OEM construction set for varied, customized options

- Changes in
  - Hardware (e.g. flash disk for drive-less operation)
  - Operating system (e.g. operating system Windows XP embedded)
  - Software (e.g. with WinCC and STEP 7)

Industry-specific versions for the food and automotive industries
Tailored to your Requirements: **Customized Products**

**Complete HMI operator stations**

- Operator station with Panel or Panel PC incl. installation, wiring and testing

- Ready-to-install with optimum, passive cooling

- All-around degree of protection complying with IP65 and NEMA 4

- Also available in bracket- or pedestal-mount form
Tailored to your Requirements: Customized Products

Open Platforms for open Applications: Open Platform Program

Customized Software Solutions for Panels and Multi Panels under Windows CE
- Additional Project Functions
- Addition of ActiveX Objects
- Customer Applications in parallel Operation
- Porting of own or third-party SW Applications

Software Development Kits (SDKs) for developing and porting software solutions also for the PC-based visualization

for individual software solutions
SIMATIC HMI Overview

Introduction
Operator Devices
Multifunctional Platforms
WinAC MP
THIN CLIENT
PC Platforms
Flat Panel Monitors
HMI Software
Customized Products

All about SIMATIC HMI
Service, Training and more

Siemens Contact Person near you
 Branch Offices and Representatives in over 190 Countries

Worldwide Delivery ex Warehouse

Fast Help through worldwide Service & Support
 Qualified onsite Support, via Hotline or Internet
 Spare Parts and Repairs

SIMATIC HMI Training: SITRAIN
 At 130 Locations or worldwide via the Internet
Competent Partner for Automation Solutions

Siemens Automation Solution Partner
- Competent contact person available near you at any time
- Always state-of-the-art SIMATIC HMI technology

WinCC Competence Centers by Siemens
- Offer a broad range of products and services for control, process and production engineering based on WinCC

WinCC Specialist
- Offer customized and economical solutions for various industries and technologies based on WinCC
SIMATIC HMI in all Industries

As the worldwide leader, employed everywhere a perfect HMI is demanded

In Manufacturing, Process or Building Automation

Numerous References from the
- Automotive Industry
- Semiconductor Industry
- Pharmaceutical, Chemical Industry
- Food Industry
- and many more

A number of interesting application reports can be found at www.siemens.com/hmi-applications
Thank you