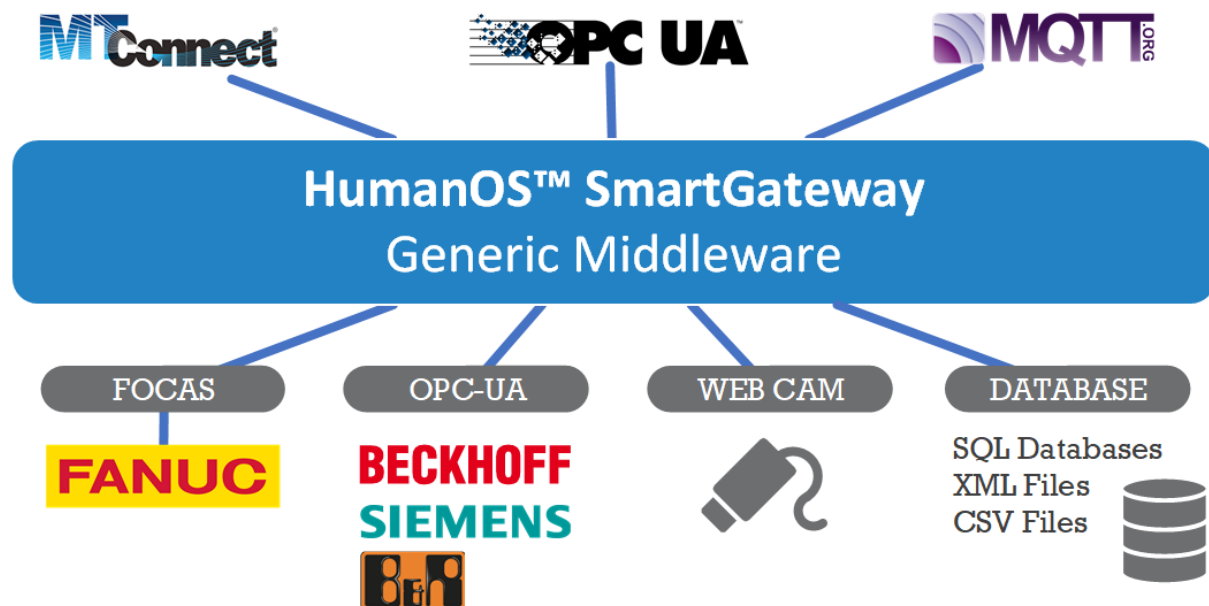


Specification

1 STANDARD EDITION

The standard version of HumanOS SmartGateway is designed to fully integrate machines into MES, OEE and Smart Factory environments. The gateway allows collecting and correlating data directly on the machine. It also includes the management of tool life data and NC program data.

The Standard Edition provides the full functionality of OPC-UA for CNC controlled machines such as data access, history access, alarm and conditions, program access and commands.



A principle of HumanOS is that all data points and correlations are configurable in XML files. This means that the end customer can adapt the gateway to his needs and configure new data correlations even after years.

1.1 YOUR ADVANTAGES

- Simple and high-performance integration of tooling machines into your SmartFactory
- Provides the basis for condition monitoring and predictive maintenance
- Open platform, which is very easy to expand (own plugins, rules, data correlations etc.)
- Works with and without cloud/networking. Data can be correlated and historicized directly on the system

2 HARDWARE PLUGINS

The following CNC controls are supported with the current version. Further hardware plug-ins are in the development backlog of 2018. The cooperative development of further customer-specific hardware plug-ins is described in chapter 11 DEVELOPMENT OF NEW CONTROL PLUGINS

Hardware	Description
<i>FANUC CNC Controls</i> (0i-D, 0i-F, 3xi-A/B) *	Features: <ul style="list-style-type: none"> - Connection over Ethernet or HSSB - Auto Configuration Detection - High Performance Memory Cache - Access to all PMC and NC Memories - Multi-Path Support for PMC und NC - Program Management - Tool Life Management
<i>OPC-UA Controls</i> (BECKHOFF, B&R, SIEMENS, ...)	Integrating OPC-UA enabled hardware devices Features: <ul style="list-style-type: none"> - Data Access - Commands - Alarm & Condition
<i>NUM Flexium and Flexium+ **</i>	Integration of NUM Flexium and Flexium+ Features: <ul style="list-style-type: none"> - Connection over Ethernet - Program, Axis and Operation Status - Access to PLC and NC Memory - All Alarm and Events (Requires the FXServer installation on HumanOS Host IPC)
<i>BECKHOFF</i>	Integration of PLC controls without additional OPC-UA options. Features: <ul style="list-style-type: none"> - Access to complete PLC memory.
<i>ANDRON Controls **</i>	Features: <ul style="list-style-type: none"> - Connection over Ethernet - Program, Axis and Operation Status - Manual Parameters - Alarms and Events
<i>Hosting System (IPC)</i>	Features: <ul style="list-style-type: none"> - Information about Operation System and HumanOS Installation - Memory usage HDD - Logged in users
<i>USB Web CAM</i>	Plug and Play of Web cams directly on the machine for process monitoring. Video stream accessible over OPC-UA.

(*) Other controllers first require a technical clarification.

(**) Available Summer 2018

Many machine builders have developed their own HMI operating software. To acquire these data, additional data sources can be attached to the gateway.

Data Sources	Description
SQL Database	Connecting to SQL databases Features: <ul style="list-style-type: none"> - MySQL, MSSQL and MS Access - Read-only access
XML File	Accessing XML files Features: <ul style="list-style-type: none"> - Read and write access - Auto detection of content changes

3 SERVICE PLUGINS

HumanOS.SmartGateway is an open interface and can be easily integrated into higher-level systems. The following services are available in the current version:

Services	Description
<i>OPC-UA Server</i>	Access to all data points, alarms and their history using the OPC-UA protocol Features: <ul style="list-style-type: none"> - Data Access DA - Alarm & Conditions - History Access HA of data and events - Commands e.g. FANUC's program and tool management
<i>MQTT Publisher / Subscriber</i>	Access to data points using the MQTT protocol. Enables connecting to cloud and fog applications Features: <ul style="list-style-type: none"> - Publishing and subscribing of data points - Configurable payload enables flexible integration into cloud platforms like Azzure, Red-Node, ...
<i>MTConnect Agent</i>	All data points can be accessed using the MTConnect protocol 1.3

4 LOCAL HISTORY

The gateway comes with a history access for data points, events and alarms. The history is divided into two parts: one high-resolution history (up to 20Hz) from the last five minutes; and a long-term historicization whose record rate and expiration is configurable for each data point.

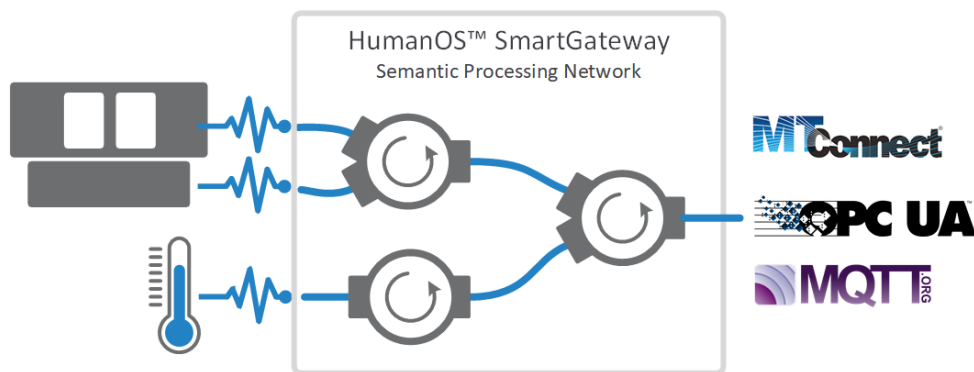
The history is stored in a locally database to prevent unauthorized access or in case of a network failure data loss (for example, unreachable MES services). The SQLite Database Plugin ensures data consistency even in the event of uncontrolled shutdown of the systems (e.g. in the case of a power failure).

5 DATA CORRELATIONS

With HumanOS™ SmartGateway, data correlations and situation analyzes can be performed directly on your system. This allows you to easily adapt a wide variety of systems to a homogeneous information layer.

With the HumanOS™ Kernel, you have a dynamic and highly flexible tool at your disposal to define your own processing networks and to make profitable use of your workshop know-how for digitalization.

As raw data directly on the machine gets correlated and processed into meaningful pieces of information, the data traffic is significant reduced if you use cloud applications.



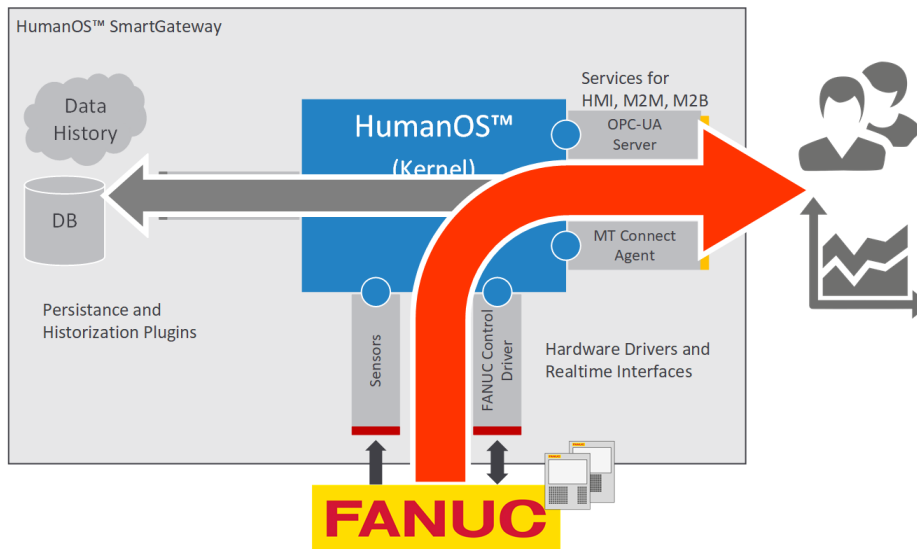
6 APPLICATIONS

HumanOS can be used for a variety of purposes in the fields of data acquisition, operating and interaction with tooling machines.

6.1 CONNECTIVITY FOR FANUC CONTROLS

HumanOS™ SmartGateway offer you a comprehensive OPC UA server and a MTConnect Agent for FANUC controllers. This intelligent and high-performance gateway allows you to connect your machines and robots with MES, ERP, cloud applications and remote maintenance services.

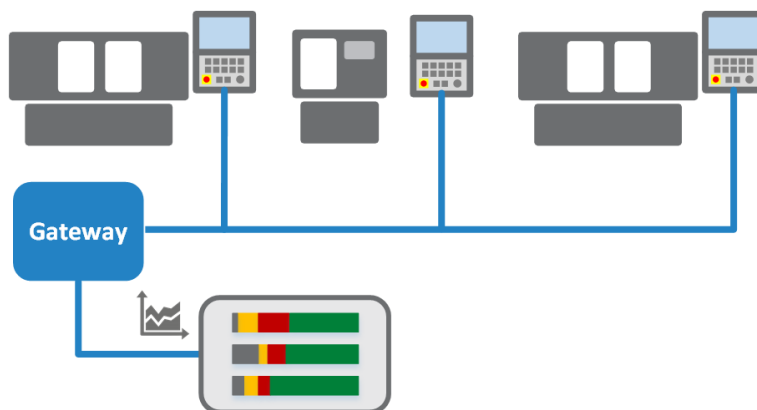
OPC UA and MTConnect can be operated in parallel. This allows a very open and flexible integration into your Smart Factory.



6.2 MONITORING OPERATION STATUS

With HumanOS™ SmartGateway, you can easily capture and evaluate the operating status of your machines. The customizable data processing and correlation allows you to define your own operating states.

- Linking CNC control states
- Alarms and Conditions
- Workpiece information
- Program information

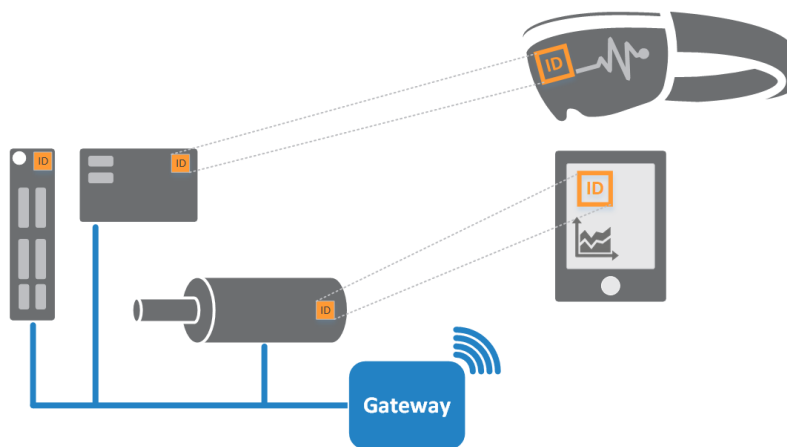


6.3 DIGITALIZED MAINTENANCE

HumanOS™ SmartGateway is the perfect tool for the maintenance of your machines. By efficiently and easily analyzing the machines and their components, you can react proactively and quickly to failures and therefore strongly minimize the downtime of your production.

- View real-time data directly on the HoloLens/Tablet

- Situation detection of the machine/modules
- Customized HMI's on HoloLens and Tablets for maintenance and production



General Agreements

7 LICENSE MODEL

CyberTech Engineering HumanOS software licenses are based on a simple per-machine basis without any runtime or annual fees. This maximizes cost savings at machine distribution and installations.

The program license allows you to use HumanOS SmartGateway within your company. A machine license allows you to connect a specific machine control with a HumanOS SmartGateway installation.

The price for the license includes one-year standard support and updates that can be continued by buying a „One Year Maintenance Package“. Additionally, individual support packages are available on request.

When you buy a HumanOS SmartMachine package, you receive the following:

- One Program License: The right to install and use HumanOS SmartGateway as an end user
- Machine Licenses: The right to connect per machine license one machine to HumanOS SmartGateway
- Support: The license comes with a standard support package. Additional support packages can be purchased
- The latest tested and released version of HumanOS.SmartGateway

Read the full software license agreement for more details.

8 SUPPORT MODEL

CyberTech Engineering is committed to superior customer service. To best serve customer's needs we offer a variety of support packages and methods. The standard support policy covers

- Two working days response time
- E-mail and telephone support during the time a maintenance package is valid
- Support and updates only on licensed machines

Our Office hours are from Monday to Friday between 08:00 to 18:00.

The standard support policy DOES NOT cover

- **Training and Consulting** - Basic training and individual consulting regarding HumanOS, the configuration of hardware drivers or your specific application are not covered by the standard support policy but can be requested for an additional service fee
- **On Site Technical Support** - Support at the customer's company location is not included but can be requested for an additional service fee
- Assistance on unlicensed machines are extra charged services and are not covered by the standard support policy

9 PAYMENT & DELIVERY

All HumanOS products must be prepaid and delivery will be started directly after receipt of payment. CyberTech Engineering accepts Bank Transfer only. All transfer fees must be paid by the purchaser.

All payments must be issued in Swiss Francs (CHF). The download link to HumanOS products will be shipped via e-mail. The software is made available for download from the *wetransfer* website. The program license is included in the installation file.

Each machine license must be requested using the [CyberTech.License.RequestApp.exe](#) directly on the target host system. Then the request must be sent to humanos@cybertech.swiss to acquire a valid machine license. Machine licenses are exclusively managed by CyberTech Engineering.

Support fees are due on the 1st of January and can be paid in two rates a year by arrangement. For license packages purchased after January of the previous year, the monthly difference will be charged and credited to the new annual fees.

For example, for a package purchased in March 2018, three quarters of the support fee for this package will be payable on January 1, 2019.

10 SUPPORTED OPERATION SYSTEMS

HumanOS SmartGateway requires at least the .NET Framework Version 4.5.2. CyberTech Engineering suggests running HumanOS SmartGateway on Window10 Home, Professional or Windows10 IoT Enterprise. The software is also tested on Windows 7 and 8 platforms. We do not suggest using unsupported Windows versions. Windows XP does not support the .NET Framework version 4.5.2.

Currently, HumanOS SmartGateway uses the Win32 Focas Driver. Therefore, HumanOS SmartGateway CANNOT run on Windows RT, Windows Mobile, Android or other Unix based systems.

Any free support is excluded if unsupported operating systems are used.

11 DEVELOPMENT OF NEW CONTROL PLUGINS

Our principle is that we connect all existing and future controllers to HumanOS.SmartGateway. To implement this principle, we use up to 50% of the support revenue for the new and further development of plugins and control features.

The customer is entitled to influence these developments by being able to co-define the prioritization of the development work together with CyberTech Engineering. The functions and features that will be implemented are agreed individually and bilaterally with the customer. However, the development authority is in any case with CyberTech Engineering.

The sequence of the developments follows the principle of "first-come first-serve", whereby key-customers enjoy a higher priority.

The new functions and features are automatically made available to all customers with the software updates and are free within the ongoing support policy.

In the following situations, CyberTech Engineering reserves the right to develop a specific project and financing plan with the customer:

- Expenses exceeds 50% of the agreed total amount of the support policy
- High procurement costs or license fees for test software and test hardware
- Low number of machines (10 or less machines)