

Specification

HumanOS® IoT Gateway

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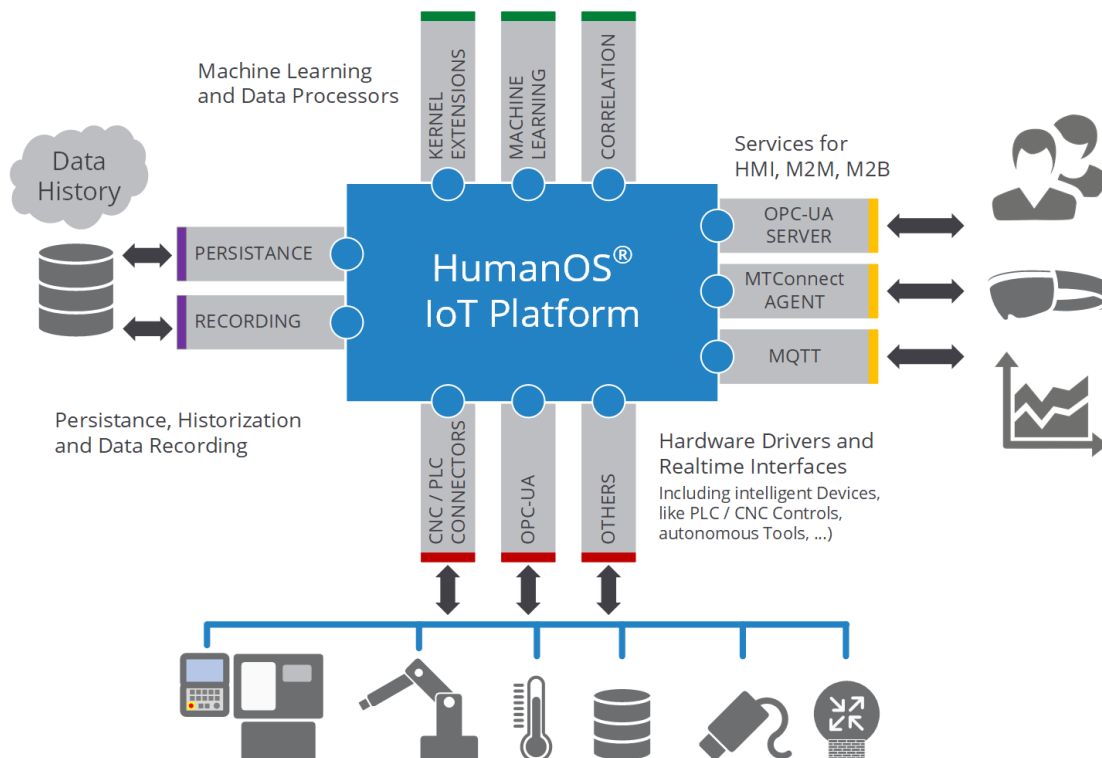
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1 General Information

The HumanOS® IoT Gateway is a single micro-service able to fully integrate devices and low-level systems into Cloud-Platforms, MES, OEE and SmartFactory environments.

The gateway allows a bidirectional communication with devices, that is collecting and correlation of data from machines, as well as sending data back to the device.

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



1.1 Host Requirements

The gateway requires:

- Operation system: Windows 10, Debian 10.x or Raspberry Pi OS
- Installation of .net5.0 runtime
- Min. 200 MB free disk space (full installation)
- Min. 4 GB RAM

1.2 Basic Functions

- Device interfaces
 - Loading of multiple devices
 - Data access

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- Alarm and Event
 - Command access
- Data correlation
 - With simple predicate language
 - With C# scripts
- Historization
 - Locally in SQLite database
 - Remotely in MariaDB or MySQL
 - High resolution history up to 20Hz for past 5 minutes
 - Data individual long term sampling rate and retention time
- Diagnostics
 - Log information with serilog
 - Logging to console
 - Logging to files with flexible retention time in days
 - SignOfLife for device connections

1.2.1 Historization

All data and events can be historicized at will. The history is divided into two parts: one high-resolution (up to 20Hz) of the past five minutes, and a long-term history whose record rate and expiration are individually configurable for each data point.

The history is stored locally in a database to prevent data loss in the event of a network outage (e.g. unavailable MES services, IT maintenance windows, etc.).

HumanOS® only uses persistent technologies to ensure data integrity even in the event of uncontrolled shutdown of systems (e.g. in the event of a power failure).

2 Connectors

Connector/Device/System	Description	Win-x32	Win-x64	Linux-x64	Linux-ARM
<i>MICROSOFT Active Directory</i>	Access to Microsoft® Active Directory. Features <ul style="list-style-type: none"> - User create/read/update/delete - UserGroups create/read/update/delete - Computer create/read/update/delete 	X	X		
<i>ANDRON Controls (CNC)</i>	Features: <ul style="list-style-type: none"> - Connection via Ethernet - Program, axis and operation status - Hand-parameter - Alarms and events 	X	X		
<i>BALLUFF Bis-V Controller</i>	Access to Balluff RFID <ul style="list-style-type: none"> - Read Tag and user memory - Write user memory 	X	X		
<i>Beckhoff PLC Controls</i>	Native access to Beckhoff PLC. <ul style="list-style-type: none"> - Connection via Ethernet (ADS protocol) - Access to entire PLC memory 	X	X		
<i>Bluetooth Connector</i> <i>RFCOMM</i>	Connection to RFCOMM <ul style="list-style-type: none"> - Processing payload with C# script file (reading and writing) 	X	X	X	X

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<p><i>EROWA JMS / MDC</i></p>	<p>Integration of EROWA loader and control systems</p> <p>Features:</p> <ul style="list-style-type: none"> - Management of products - Create and monitor orders <p>Status Query of machines on the EROWA system</p>	X	X	X	X
<p><i>FANUC CNC Controls</i> 0i-D/F, 30i-A/B, 31i-A/B, 32i, 35i (15i, 16i, 18i, 21i, as well as 15, 16, 18, 21) *</p>	<p>Features:</p> <ul style="list-style-type: none"> - Connection via Ethernet or HSSB - Auto Configuration Detection - High Performance Memory Cache - Access to all PMC and NC Memory - Multi-Path Support for PMC and NC - Program Management - Tool Life Management <p>(*) The FANUC controls 15i, 16i, 18i, 21i, as well as 15, 16, 18, 21 first require a technical clarification.</p>	X	X		
<p><i>XML File Sources</i></p>	<p>Connection of XML files</p> <p>Features:</p> <ul style="list-style-type: none"> - Reading and writing possible - Automatic update when the content of the file changes. 	X	X	X	X
<p><i>HEIDENHAIN CNC Controls</i> <i>iTNC530, iTNC640</i></p>	<p>Features:</p> <ul style="list-style-type: none"> - Connection via Ethernet - Program, axes and operation status - Access to PLC and NC memory variables - All alarms and events <p>(Requires RemoTools installation on the HumanOS Host IPC)</p>	X	X		

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<i>Hosting System (IPC)</i>	<p>Features:</p> <ul style="list-style-type: none"> - Information about operating system and HumanOS installation - Memory usage HDD - Logged in users - Run powershell scripts - Starting applications in the user context 	X	X	(X)	
<i>Modbus TCP</i>	<p>Features:</p> <ul style="list-style-type: none"> - Reading and writing registers 	X	X	X	X
<i>NUM Flexium and Flexium+</i>	<p>Features:</p> <ul style="list-style-type: none"> - Connection via Ethernet - Program, axes and operation status - Access to PLC and NC memory variables - All alarms and events <p>(Requires FXServer installation on the HumanOS Host IPC)</p>	X	X		
<i>NUM Axiom</i>	<p>Features:</p> <ul style="list-style-type: none"> - Connection via Ethernet - Program, axes and operation status - Access to PLC and NC memory variables - All alarms and events <p>(Requires AXServer installation on the HumanOS Host IPC)</p>	X	X		
<i>OPC-DA enabled devices</i>	<p>Integration of OPC-capable hardware devices (SIEMENS, ...)</p> <p>Features:</p> <ul style="list-style-type: none"> - Data Access 	X	X		

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<p><i>OPC-UA enabled devices</i></p>	<p>Integration of OPC-UA compatible hardware devices (BECKHOFF, B&R, SIEMENS, ...)</p> <p>Features:</p> <ul style="list-style-type: none"> - Data Access - Commands - Alarm & Condition - Server Authentication 	X	X	X	X
<p><i>RESTful Interface</i></p>	<p>Allows the connection of software and hardware supporting the REST protocol.</p> <p>Features:</p> <ul style="list-style-type: none"> - HTTP and HTTPS - GET, DELETE, POST, PATCH, PUT - http authentication - Payload as text, XML and JSON - Create or process payloads through C # scripts 	X	X	X	X
<p><i>Serial Interface</i></p>	<p>Connecting to devices over serial interfaces (COM)</p> <p>Features:</p> <ul style="list-style-type: none"> - Processing payload with C# script file (reading and writing) 	X	X	X	X
<p><i>Siemens S7 Controlls</i> <i>S7-200, S7-300, S7-400</i> <i>S7-1200, S7-1500</i></p>	<p>Connecting to S7 PLC controllers</p> <p>Features:</p> <ul style="list-style-type: none"> - Reading and writing memory - OEM alarming using alarm mappings 	X	X	X	X
<p><i>SQL Sources</i> <i>MS-SQL, MySQL, MariaDB, AccessDB</i></p>	<p>Connecting to different SQL source.</p> <p>Features:</p> <ul style="list-style-type: none"> - Read only access 	X	X	X	X

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<i>SSH enabled devices</i>	<p>Connecting to devices using the SSH protocol</p> <p>Features:</p> <ul style="list-style-type: none"> - Commanding over SSH - Parsing returns using C# scripts 	X	X	X	X
<i>TCP/IP</i>	<p>Generic TCP/IP connector</p> <p>Features:</p> <ul style="list-style-type: none"> - Processing payload with C# script file (reading and writing) 	X	X	X	X
<i>USB Web CAM</i>	<p>Plug and play of web cameras directly at the machine for process monitoring. Access via OPC-UA server possible.</p> <p>Features:</p> <ul style="list-style-type: none"> - Start and Stop of the camera - Frame rate approx. 10-50Hz depending on utilization. 	X	X	(X)	(X)

3 Services

Service/Platform	Description	Win-x32	Win-x64	Linux-x64	Linux-ARM
<i>Azure IoT Platform</i>	Access to Azure IoT Platform using the device-interface <ul style="list-style-type: none"> - Data logger - Data subscriber - Customized payload processing with C# scripts 	X	X	X	X
<i>CSV files</i>	Data logger to CSV files <ul style="list-style-type: none"> - Customized payload processing with C# scripts 	X	X	X	X
<i>InfluxDB</i>	Data logger to influx DB <ul style="list-style-type: none"> - Customized payload processing with C# scripts 	X	X	X	X
<i>MQTT</i>	Publishing and Subscribing over MQTT <ul style="list-style-type: none"> - Data Logger - Data subscriber - Customized payload processing with C# scripts 	X	X	X	X
<i>MTConnect Agent</i>	The MTConnect agent implements the 1.3 specification without the asset extensions. <ul style="list-style-type: none"> - Data Access - Samples - Queries 	X	X	X	X

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<i>OPC-UA Server</i>	<p>Full OPC-UA Server</p> <ul style="list-style-type: none"> - Data Access (DA) - History Access (HA) - Alarm & Conditions (A&C) - Commands - Program Management - Image Transfer for Web Cams - Authentication anonymously, with login, user certificates - Binary communication, with or without encryption 	X	X	X	X
<i>RESTful Data Logger</i>	<p>Data logger to Webserver using REST:</p> <ul style="list-style-type: none"> - Customized payload processing with C# scripts 	X	X	X	X
<i>SQL DataLogger</i>	<p>Datalogger to SQL database</p> <ul style="list-style-type: none"> - MariaDB or MySQL - Customized payload processing with C# scripts 	X	X	X	X
<i>RabbitMQ Platforms</i>	<p>Publishing and Subscribing over RMQ</p> <ul style="list-style-type: none"> - Data Logger - Data subscriber - Customized payload processing with C# scripts 	X	X	X	X

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<i>WebService</i>	Full access to HumanOS Kernel over REST API <ul style="list-style-type: none"> - Command Access - Data Access - History Access - Alarms and Events - Workflows - Entity Model - http and https - RESTful filter - Multiple WebServer instances possible 	X	X	X	X
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4 Support

CyberTech Engineering GmbH is committed to world-class customer service. To optimally meet the needs of our customers, we offer various subscriptions:

- Maintenance Subscription: Maintenance and upkeep of your software installation, incl. Technical support.
- Upgrade subscription: download the latest HumanOS® IoT platform for free.

Technical Support	Maintenance	Update	No Program
General Technical Support	X	*	*
Troubleshooting per Remote	X	*	*
Fault notification by e-mail and telephone	X	*	*
Access to ticketing system	X	*	*
Access to Online Knowledge Base ¹	X		
Development partner status	X		
Software Updates and Upgrades			
Software Patches and Bugfixes	X	X	*
Software Updates and Upgrades	X	X	*
License Administration			
Access to HumanOS® Lizenzportal	X	X	X
License Recovery	X	X	*

(*) Services can be ordered. Charging takes place after effective effort.

(1) Available in mid-2021

5 Explanations to the Terms and Conditions

The following explanations are a summary of the official terms and conditions of CyberTech Engineering GmbH. These explanations are not binding. Read the terms and conditions of CyberTech Engineering GmbH.

5.1 License Agreement

CyberTech Engineering GmbH HumanOS® software licenses are based on a simple machine base with no runtime or renewal fees. This maximizes the cost savings in the distribution and installation of machinery.

With the program license you can use HumanOS® in your company. With a device license, you can connect a specific device to the HumanOS® IoT platform. The price of the license includes initial support incidents and updates for one year. Support can be continued through a maintenance or update subscription. In addition, individual support packages are available on request.

When you purchase a HumanOS® IoT platform, you will receive the following:

- A Program License: The right to install and use the HumanOS® IoT Platform as an end user.
- Device Licenses: The right to connect a device to HumanOS® IoT Platform per license
- Support: The program license contains an initial maintenance subscription. Additional subscriptions can be purchased accordingly.
- The latest tested and released version of the HumanOS® IoT platform.
- The latest version of the HumanOS® IoT Designer to create and manage your configurations.

The administration of the licenses takes place via the HumanOS® license portal and is carried out independently by the customer.

Read the full software license agreement for more details.

5.2 Support Conditions

In the first year, the purchase of a maintenance subscription is obligatory. This is included in the basic license package. From the second year, a maintenance or update subscription can be purchased.

5.2.1 Maintenance Subscription

The maintenance subscription covers the following:

- Response time within one working day
- Support by e-mail or phone during the time a maintenance package is valid.
- Support and updates only on licensed devices

Not included are:

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- Training and consulting. Basic training and personalized consulting on HumanOS®, OPC-UA, hardware driver configuration, or your specific application are not covered by the standard support guidelines but can be requested for an additional service fee.
- On-site technical support is not included but may be requested for an additional service charge.
- Support for unlicensed machines and computers are additional services and are not covered by the standard support policy.

5.2.2 Update Subscription

With the update subscription, you will receive the latest HumanOS® IoT platform incl. the latest collection of industrial connectors.

Not included are technical support, training, etc. These services will be charged extra.

5.3 Payment & Delivery

All HumanOS® products must be paid in advance. The delivery follows immediately after receipt of payment. CyberTech Engineering only accepts bank transfers. All transfer fees are charged to the buyer. Payments must be made in Swiss francs (CHF). The download link to HumanOS® products will be sent by e-mail. The software is available for download on the CyberTech data share.

Support fees are due on the 1st of January and can be paid twice a year by arrangement. For license packages purchased after January of the previous year, the difference will be counted on a monthly basis.

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.

5.4 Supported Operating Systems

The HumanOS® IoT Gateway requires at the .NET Framework Version 5.x. CyberTech Engineering GmbH recommends running the HumanOS® IoT runtime on Windows10 Home, Professional or Windows10 IoT Enterprise. Windows XP, 7 and 8 are not supported.

The HumanOS® IoT Gateway is supports also Linux based OS. It is tested on Debian 10.x and Raspberry PI OS®.

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

5.5 Development of new Connectors and Services

Our policy is that we connect each device to the HumanOS® IoT platform. To implement this principle, we use up to 50% of the maintenance subscription revenue for the new and further development of connectors and control features.

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

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

The new features and functions are automatically made available to all customers with the software updates and are free within the current subscription.

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

- Expense exceeds 50% of the agreed total amount of the subscription.
- High procurement costs or license fees for trial software and test hardware.
- Very low number of machines (10 or less machines).

5.6 Contact Address

Headquarters in Switzerland

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