Master increasing complexity systematically with u-control solutions from Weidmüller

Let's connect.

Automation & Software

Weidmüller

Flexible Automation of Applications

u-control 2000 for a powerful and compact control system

The powerful u-control 2000 controller is based on a compact design of the u-remote fieldbus coupler - for even greater space savings and maximum flexibility in the implementation of individual automation solutions. It is compatible with the entire u-remote portfolio and offers the possibility to connect to I/O modules directly. Combined with our versatile Engineering tools, u-create studio and u-create web unfold their full potential range of applications.

The u-control 2000 is equipped with an Ethernet based fieldbus and a TCP/IP interface for programming. The controller also has an optional CAN interface. Optionally, communication via the Modbus TCP protocol is also possible. In addition, u-control 2000 has a dual-core ARM-A9 processor and a USB service interface. In addition to the battery-buffered real-time clock, it also has a slot for a MicroSD with up to 32 GB.

In combination with the u-create software tools, u-control enables maximum customization options.

Considerations for Selecting an Effective Control Solution

Understanding the needs of the application and the desired results are crucial factors to effectively specifying the required features of a control system.

	What to consider ...	The importance of why ...
Installation	• Is this a new system installation or will this be an extension to an already existing system infrastructure? • Is there a need to replace only certain components within an existing system due to a component failure, etc.?	When interfacing with existing systems, ensure the controller and all other components of the system are compatible with any new products; not all system components are equal nor interchangeable.
Environment	• What type of environment will the system be installed in? • Will the location warrant the need for any special approvals or special operating conditions, i.e., Class I, Div 2, ATEX, IECEx, extended temperature range, etc.	Certain environmental factors can have a direct affect on the operation of the control system; for instance, harsh environments, extreme temperature conditions, high vibration, dust, etc. In such cases, ensure the control system in its entirety meets the necessary conditions or design the installation to meet the specifications of the components within the control system.
CPU	• What type of CPU is needed? • How fast of a scan time is needed? Are there "time critical" operations or events that must be identified? • How much memory is required? • How many devices will the system include? (determines data memory) • How large is the program, and what types of instructions will the program include? (determines the program memory)	Responsible for the execution of program instructions, data collection and other various tasks, the CPU serves as the brains of the control system. For this reason, it is crucial to ensure the CPU is fast enough, especially when scan time is an important factor and that it has enough processing power to support the requirements and expectations of the system as a whole; while also providing the flexibility to readily integrate new devices or subsystems for future expansion. The processor memory is also of high importance. When determining the amount of data memory needed, take into account instructions that require storing of setpoints, current values and other internal flags, such as with counters and timers. Determine also whether the application requires historical data logging, such as measuring device values over an extended period of time. For determining the amount of program memory, a specific amount of memory is needed for storing the sequence of program instructions that have been selected to perform the application.
I/O	• What field devices will the controller need to connect with such as, analog sensors, digital sensors, solenoids, actuators, control valves, etc. and how many of each? • What is the function and signal level of the analog devices? • What are the power requirements of each device? • What is the physical location of the I/O terminals with respect to the field devices?	The type of devices within the system and their functions, not only determine the type of I/O and I/O count needed, but greatly influences the selection of the control platform and have a direct effect on the systems' overall performance. It is important to ensure the selected controller can support the number of I/O points, as well as, the types that are defined, and whether additional specialty modules are needed. The physical location of the I/O terminals with respect to the field devices will determine whether remote I/Os opposed to local I/Os, or a combination of both are needed and will help to determine what real-time communication protocols may be necessary.
Special Functions / Features	• Will the system require any special features or functions such as: PID, high-speed counting, positioning, energy monitoring, safety, real-time clock, IO-Link or serial communication, etc.?	Realizing any special functions or features that are needed for the application will determine whether the control can support it and whether additional specialty modules are needed.
Programming	• What are the programming requirements? • Will conventional programming instructions be used for controlling the program and the program flow, or will specialized programming instructions, such as drum sequencers, floating point conversions, etc. be needed? • Will traditional IEC 61131-3 programming languages be used, or will a higher-level language such as object-oriented programming in C/C++ be used?	As most controllers require specific software engineering tools to program it, it is critical to know whether the defined programming functions can be supported by the engineering software.
Communication	• Will the control system be communicating to specific networks, field devices or other systems?	Knowing the communication requirements of the system at the field device level, control level and data level, will help to ensure the proper controller and engineering software are selected and whether additional communication modules are needed.

Product Overview

Hardware with License-free, Web-based u-create Engineering Software Included

Automation Controller UC20-WL2000-AC, 1334950000

Visualization

SmartVisu

- Web-based visualization in HTML 5 browser
- Embedded on device
- Included at NO additional cost

HMI: No license needed

Hardware

u-control hardware
UC20-WL2000-AC

Control

u-create Web

- Engineering development tool & user-interface software apps
- Embedded on device
- Included at NO additional cost

Apps

OPC UA, Node-RED, u-link

Web browser is embedded on device

IoT Controller UC20-WL2000-IOT, 1334990000

Hardware

u-control hardware
UC20-WL2000-IoT

Control + Visualization

u-create Web IoT

- Embedded Engineering development tool based on Node-RED.
- IT & IoT application ready.
- Included at NO additional cost.

Node-RED

Apps

OPC UA, u-link

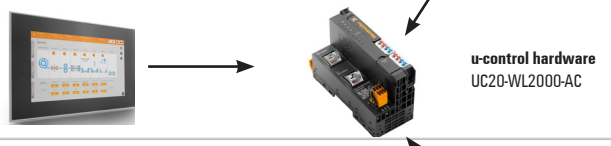
HMI: No license needed

What's included:	Hardware	●	●
	Control - Engineering Development Software:	●	●
	• Web-based u-create web with integrated Node-RED & Web-Server	u-create web (control environment)	u-create web/IoT (Node-Red environment)
	• Codesys V3 compatible (based) u-create studio & Web-Server	–	–
	• Runtime License for Engineering Development Software	● (included with the controller firmware)	● (included with the controller firmware)
	Visualization: • Smart-Visu • PROCON-WEB	● (embedded web-based Smart-Visu)	● (embedded web-based Smart-Visu)
	• Runtime License for Visualization	● (included with the controller firmware)	● (included with the controller firmware)

Licenses (additional one-time expenses that are NOT included):

Control & Optional Software Packages:		
• u-create studio for UC20-SL2000 controllers	–	–
• Runtime License	–	–
Visualization:		
• PROCON-WEB Designer for Embedded Systems or SCADA Systems	–	–
• Runtime License	–	–

Hardware with Runtime License Included

OpenLinux & Automation Controller with EtherCAT interface UC20-SL2000-OLAC-EC, 2638920000	OpenLinux & Automation Controller with EtherCAT & CAN interface UC20-SL2000-OLAC-EC-CAN, 2655590000
Visualization u-create-PROCON-WEB **Programming Software** U-CREATE-PROCON-WEB-D-ES-xxx (xxx = max # of tags) Device Runtime License: U-CREATE-PROCON-WEB-RT-ES-xxx (xxx = max # of tags)	
Hardware	
Control u-create-studio **Programming Software** U-CREATE-STUDIO-xxx (xxx = programming language) Device Runtime License: U-CREATE-STUDIO-RT-xxx	
Apps	
●	●
–	–
x [a]	x [a]
A 30-day trial license of u-create studio is included with the controller after which, a fully licensed version must be purchased.	
●	●
The u-create studio-RT-OLAC for Codesys and C/C++ is included / packaged via a Ticket code when purchasing the bundle sets. Note: You can migrate the run-time license for one controller to another but only twice. A new run-time license is required if additional transfers are needed.	
x [b]	x [b]
To create a visualization project for the UC20-SL2000 controllers, the web-based visualization for embedded systems, u-create-PROCON-WEB Designer ES is required & must be purchased separately.	
● [c]	● [c]
Up to 100 tags (incl. client & mini client) are freely available with the native u-control studio driver using the software unit accessible via our website.)	

Licenses (additional one-time expenses that are NOT included):

a: u-create-studio, 2660130000 (full version) - Programming tool for both IEC61131-3 Codesys V3.5-based applications and C/C++ Engineering in Open Linux. C-Compiler , u- create scope, and Diagnose and Debugger included.

Notes:

- Licenses are for 1 user (1 PC). The license can be changed from one PC to another one, but never simultaneously.
- Licenses are only required to be purchased once; no re-occurring costs.
- Additional u-create studio options will be available in the future.

Optional OPC UA runtime module for platform independent data exchange: u-create-studio-RT-OPCUA, 2697570000

PROCON-WEB Licensing

b: Engineering Tool: PROCON-WEB Designer for Embedded Systems	**b:** Engineering Tool: PROCON-WEB Designer for SCADA (IPC-based) & u-control targets
c: Run-Time License: PROCON-WEB for Embedded Systems (software unit for u-control studio > V1.20.2)	**c:** Run-Time License: PROCON-WEB for SCADA & Visualization Systems

Note: See next page for PROCON-WEB Licensing details

PROCON-WEB Licensing in Detail

Engineering Tool: PROCON-WEB Designer for Embedded Systems

The u-create PROCON-WEB engineering tool version for embedded system is only valid to program Weidmüller u-control system. This version is not capable to design projects for SCADA systems that run into IPCs (industrial PCs). The run-time is embedded inside the controller.

Model Name	Description	Order Number
u-create-PROCON-WEB-D-ES-100	HMI designer license < 100 Tags for u-control projects	**2705820000**
u-create-PROCON-WEB-D-ES-2000	HMI designer license < 2000 Tags for u-control projects	**2705830000**

Run-Time License: PROCON-WEB for Embedded Systems (software unit for u-control studio > V1.20.2)

If you want to run u-create PROCON-WEB in any of our automation controllers, you will require a specific run-time for each hardware unit.
A free run-time license for up to 100 tags is included with any device. If you require more tags, you will need to acquire the run-time license for < 2000 tags.

Model Name	Description	Order Number
u-create-PROCON-WEB-RT-ES-100	HMI runtime license < 100 Tags for u-control, 1 client, 1 mini-client	**Included with purchase of any studio controller at no cost**
u-create-PROCON-WEB-RT-ES-2000	HMI runtime license < 2000 Tags for u-control, 2 clients, 2 mini-clients	**2708630000**

Notes:

- This licenses are only valid for HMI visualization in Weidmüller controllers (Embedded System).
- Licenses depend on the number of tags used in the Project.
- Run-time can be transferred from one controller to another.

		Automation Controller UC20-WL2000-AC, 1334950000	IoT Controller UC20-WL2000-IOT, 1334990000
Primary Functions		Acts as Operational Technology (PLC) - Control tasks (process control) in real-time: • Machine states • Sensor / Actuator interface • Control & Safety	Acts as IT (PC) – IoT and IT Tasks in non-real-time: • Connection to IoT (MQTT, REST API, etc.) • Connection to DDBB, servers and other IT infrastructure • Notifications, alarming and other tools: e-mails, SMS, etc.
Use Cases/Applications		• No field bus system • With & without real-time automation requirements • Compact to medium sized machine applications, ex. Food & Beverage, Packaging, Automotive, Conveying • Stand-alone applications, Control and Regulation automation without highly dynamic drive functions, ex. Case erector, Bakery machinery, PV - application, Sub-machine for assembly lines, Pick-to-light application. • Minimum safety requirements (E-Stop, door monitoring) - can be used in Safety application in combination with u-remote Power feed module.	• Data acquisition for IoT-purposes and control of: Water/Waste Water treatment, Traffic control systems, Energy provider, Wind and Photovoltaics industry, Transport - systems, Intralogistics, Food & Beverage companies, etc. • Simple Condition control, 2-point control, etc. • Application examples: • Warning-system (e.g. e-mail, SMS messenger) • Data upload and download to cloud systems via MS Azure, IBM Watson, Amazon • Data exchange via common protocols like OPC UA, Modbus TCP, etc. • Industrial process applications, and mechanical engineering
Fieldbus Protocols	Modbus TCP Master	● (via Node-RED & u-remote Modbus TCP coupler)	● (via Node-RED & u-remote Modbus TCP coupler)
	Modbus TCP Slave	●	●
	Modbus RTU/TCP as Modbus master	●	●
	Modbus RTU-Master with UR20-1COM-232-485-422	●	●
	EtherCAT Master/Slave	X	X
	CANopen Master/Slave	X	X
Programming Languages		Function block PLC programming for real-time and JavaScript though Node-RED	Only JavaScript through Node-RED
Functional expansion through the use of user-specific software or add-on modules: For IIOT Connectivity	Node-RED	●	●
	OPC UA	● (via Node-RED)	● (via Node-RED)
	MQTT	● (via Node-RED)	● (via Node-RED)
	REST API	●	●
	u-link	●	●

Engineering Tool: PROCON-WEB Designer for SCADA (IPC-based) & u-control targets

This engineering software is valid to program on PCs or IPCs (Industrial PCs) connected to third party devices by means of communication drivers. The tool is capable to perform SCADA (including DDBB management) and responsive visualization applications.

The following options are bundle packages that include the engineering software + (1) relevant Run-Time License for SCADA projects (IPC-based). *Additional licensing bundle packages available, if more tags are needed.

Model Name	Description	Order Number
u-create-PROCON-WEB-D-200	HMI designer license < 200 Tags for u-control projects + HMI Run-Time License < 200 Tags	**2705640000**
u-create-PROCON-WEB-D-5000	HMI designer license < 200 Tags for u-control projects + HMI Run-Time License < 500 Tags	**2705650000**

Run-Time License: PROCON-WEB for SCADA & Visualization Systems

u-create PROCON-WEB for SCADA and visualization systems requires a run-time on the target PC/IPC/IPPC.

As a reminder, the u-create PROCON-WEB for SCADA and visualization engineering tool includes (1) run-time license.
The following run-time option(s) can be purchased individually, should you require additional licenses of the run-time (for more than one target).

Model Name	Description	Order Number
u-create-PROCON-WEB-RT-200	HMI runtime license < 200 Tags, 1client, 1 mini-client, 1 driver	**2705730000**
u-create-PROCON-WEB-RT-500	HMI runtime license < 500 Tags, 1client, 1 mini-client, 1 driver	**2705740000**

Notes:
- Run-time licenses come with (1) driver. Extra communication drivers for different protocols can be acquired by means of individual licenses (pending driver).
- The run-time licenses depend on the number of tags used in the application.
- Licenses can be moved from target to target as they are dongle based.

OpenLinux & Automation Controller with EtherCAT interface UC20-SL2000-OLAC-EC, 2638920000	**OpenLinux & Automation Controller with EtherCAT & CAN interface UC20-SL2000-OLAC-EC-CAN, 2655590000**
• Programming according to EN 61131-3 • Configure, parameterize, program and debug control applications with u-create studio programming environment. • Monitor, record and visualize the values of arbitrary variables in software components (firmware components or application programs), without the need for the program sequence to be interrupted using u-create studio Scope.	• Debugging functions (testing program sequence, monitoring and modifying variables, error search). • Display expert diagnostic information through the u-create studio UosDiagnostic tool.

• Simple to moderately complex applications.
• Implementation of complex control functions.
• Real-time control & factory automation applications
• Minimum safety requirements (E-Stop, door monitoring) - can be used in Safety application in combination with u-remote Power feed module.
• Implementing modern communication protocols (e.g. MQTT, OPC UA)
	• Data acquisition for IoT-purposes and control of: Water/Waste Water treatment, Traffic control systems, Energy provider, Wind and Photovoltaics industry, Transport - systems, Intralogistics, Food & beverage companies, etc.
	• Simple Condition control, 2-point control, etc.
	• Application examples:
	  • Warning-system (e.g. e-mail, SMS messenger)
	  • Data upload and download to cloud systems via MS Azure, IBM Watson, Amazon
	  • Data exchange via common protocols like OPC UA, Modbus TCP, etc.
	  • Industrial process applications, and mechanical engineering.

● (via ModbusTCP Client function bock)	● (via ModbusTCP Client function bock)
●	●
●	●
●	●
●	●
●	●
All worldwide IEC 61131-3 compliant languages: Structured text (ST), Function block diagram (FBD), Continuous graphic Function Chart (CFC), Sequential Function Chart (SFC), Ladder Diagram (LD)	
●	●
● (via u-create-studio as an optional software unit)	● (via u-create-studio as an optional software unit)
●	●
●	●
●	●

Weidmüller – Your partner in Industrial Connectivity

As experienced experts we support our customers and partners around the world with products, solutions and services in the industrial environment of power, signal and data. We are at home in their industries and markets and know the technological challenges of tomorrow. We are therefore continuously developing innovative, sustainable and useful solutions for their individual needs.
Together we set standards in Industrial Connectivity.

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