

# EuroSkills Test Project

*Industry 4.0 + HP2*

Task F

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## List of Documents

No.	Document	Description
1	CP-AM-iDRILL Manual.pdf	Manual of the CP Application module iDRILL
2	ARSceneProgrammingReference.pdf	Technical documentation for Festo Didactic AR-App
3	FESTO_DGC-8_63_2017-07h_8075215g1.pdf	Manual of the pneumatic linear axis
4	CP-AM-iDRILL_Skills.zip	Augmented Reality scene description files for the iDRILL application module

## Introduction

Your customer's production facility is already extensively digitalized, but his maintenance activities are still based on manuals and instructions in printed form or as PDFs on a local file storage.

You as a specialist for smart maintenance solutions are employed to integrate a mobile device to support maintenance tasks at the application module. You have to implement and extend an existing augmented reality scene and document your software solution.

Based on your results, the customer expects a typical maintenance task to be performed faster and more efficiently in the future and considers your implementations as blueprint for further optimization potentials.



# Description of project and tasks

## Smart Maintenance and Optimization

Your task will be to integrate a tablet PC into the network, to identify required technical documentation provided by an Augmented Reality (AR) scene, identify scene improvement potential and to implement a change in an AR scene.




Your task will be completed when you have finished the following subtasks:

1. Connect the given tablet PC to the network by configuring a DHCP server on the S615 router in accordance with Specification 1.
2. Identify the component *pneumatic x-axis* of the application module *iDrill* and its maintenance instructions according to Specification 2.
3. Optimize the existing AR scene according to Specification 3.

## Specification 1: Mobile Device Integration

No.	Item description	Value
	<b>Configuration of the S615 router</b>	
1.10	DHCP server	activated
1.11	Subnet mask	255.255.192.0
1.12	DHCP address range	172.21.1.10 ...172.21.1.20
	<b>Configuration of the iPad</b>	
1.20	“Lightning-to-USB”, USB-to-Ethernet, Ethernet-to-CP System network	connected
1.21	IP address	obtained via DHCP
1.22	Sample web page 172.21.0.90/14.0	accessible
	<b>Documentation</b>	
1.30	DHCP server configuration of the router	
1.31	Network settings of the tablet in connected state	

## Specification 2: Identification of Maintenance Information

No.	Item description	Value
	<b>AR Scene</b>	
2.10	The following directory has to be created on the MES Server PC and the scene description files of the archive “CP-AM-iDRILL_Skills.zip” have to be extracted to this directory	D:/xampp/htdocs/ar/scenes
2.11	Scene “CP-AM-iDRILL_Skills.xml” is loaded using the Festo Didactic AR App on the iPad via the following address	<a href="http://172.21.0.90/ar/scenes/CP-AM-iDRILL_Skills.xml">http://172.21.0.90/ar/scenes/CP-AM-iDRILL_Skills.xml</a> 
2.12	Technical information about the <i>pneumatic x-axis</i> is downloaded	Data sheet
	<b>Documentation</b>	
2.20	Identification numbers of the <i>pneumatic x-axis</i>	Part number Product code
2.21	Maintenance information about the lubrication of the roller bearing of the guide	Text, graphics and colored picture
2.22	Loaded AR scene on the iPad and loaded Datasheet on the iPad	Screenshots

### Specification 3: Optimization of the Augmented Reality Scene for Assisted Maintenance

No.	Item description	Value
	<b>AR scene</b>	
3.10	New scene including the same basic functionality as “CP-AM-iDRILL_Skills.xml” is created and named	CP-AM-iDRILL_Skills_Advanced.xml
3.11	The manual of the <i>pneumatic x-axis</i> is copied to the MES Server PC to the following directory	D:/xampp/htdocs/ar/scenes/docs
3.12	Virtual button is added, as link to the manual of the <i>pneumatic x-axis</i> as PDF file	
3.13	Graphical and textual maintenance instructions are added, either placed directly nearby the axis or linked via a virtual button.	Instructions showing the lubrication of the roller bearing of the guide as prepared according to 2.21.
3.14	Virtual element is added showing the current air pressure “rPressure” measured by the Energy Measurement Box which has to be obtained via OPC UA and transferred via the following websocket to the AR app	Websocket: ws://172.21.0.90:18812/ws/idrill
	<b>Documentation</b>	
3.20	Short description of the solution	



## Instructions to the Competitor

The task and related documents will be provided on a USB stick. In the end of the task the created documentation must be provided in this USB stick back to the jury.

During the competition use of personal computers are allowed, however the final solution must be implemented on the provided MES Server PC. It is allowed to connect monitor(s), a keyboard, and mouse to the PC or to access it via Remote Desktop Connection (see *MES Server PC Documentation*, in the folder “Documents”).

During the marking, only solutions running on the competition system are evaluated, unless requested differently.

## Equipment, machinery, installations, and materials required

ITEM	QUANTITY	MATERIAL	DESCRIPTION	NOTES

# Marking Scheme

TASK	SUBTASK	BY JUDGEMENT	BY MEASUREMENT	TOTAL
F	Mobile Device Integration	1	6	7
	Identification of Maintenance Instructions	1	2	3
	Optimization of the Augmented Reality Scene for Assisted Maintenance	2	5	7
TOTAL		4	13	17