



GeKa Model 01 WELDING SIMULATOR

Users Manual

Please Read and Understand This Manual
Before Operating The Welding Machine

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1. INSTALLATION

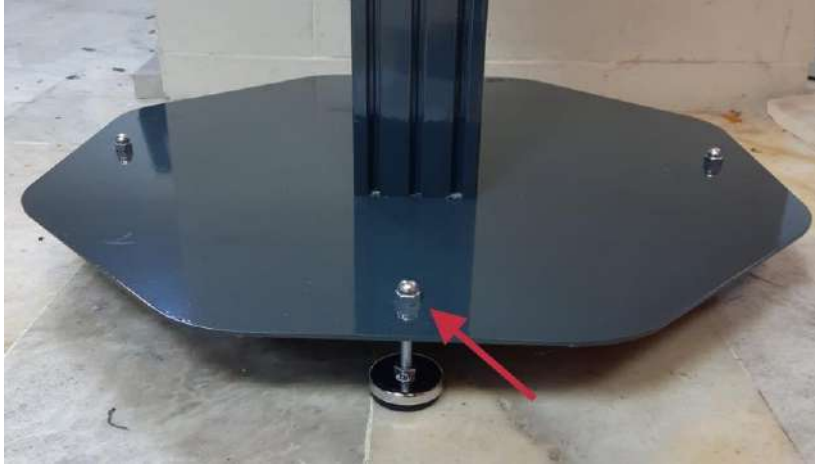
Assembly and initial installation of the simulator:

1. Open the lids of the wooden box.

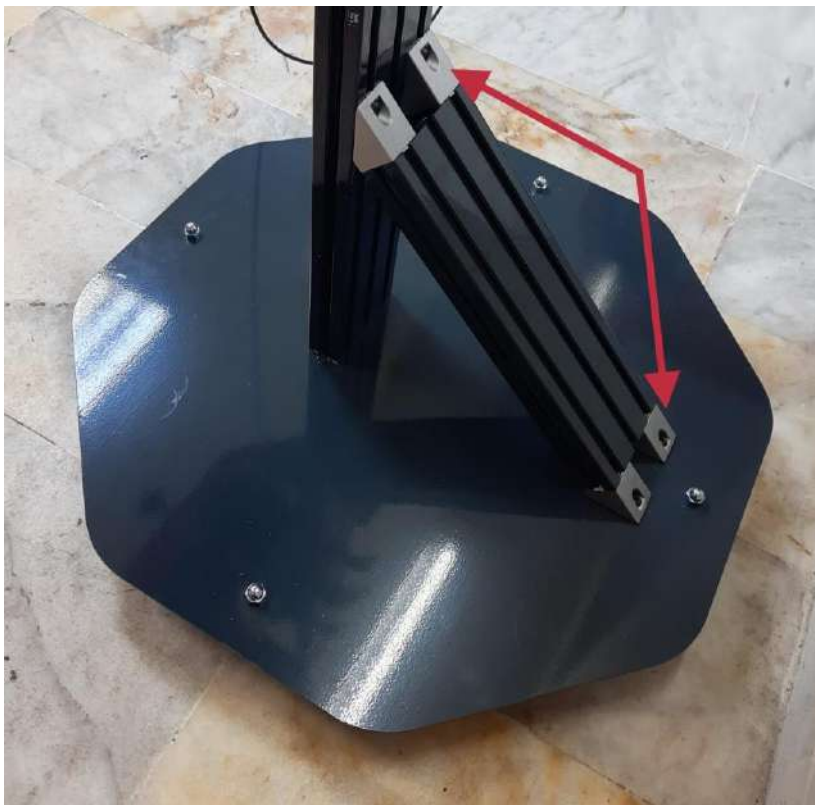


2. Unscrew the screws attaching the stand to the wooden pallet and take the stand out of the wooden box.
3. Unscrew the screws attaching the simulator device to the pallet and take the simulator device out of the wooden box.
4. Take the other equipment out of the wooden box.
5. Place the device close to the electric socket.
6. Remove the packaging nylon.

7. Mount the leg to the bottom of the stand.



8. Assemble the support part of the stand.



9. Mount the arm to the stand.



10. Place the welding stand 1-2 meters away from the device.

11. Place the parts you want to weld on the welding stand and fix it by turning the clamping arm.



12. Remove the sensor from the black part to insert the batteries of the sensors. Then open the battery cover of the sensor and insert the LR6 battery.



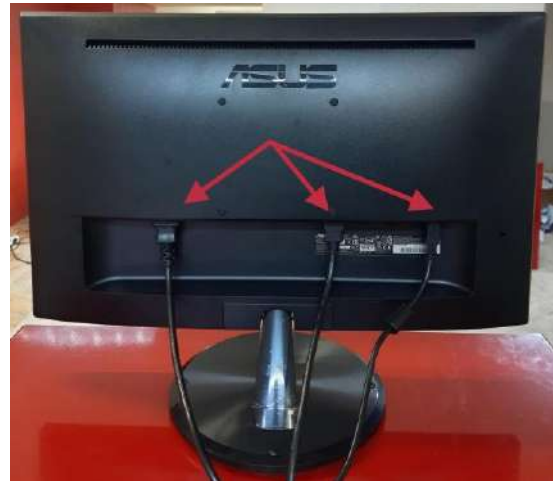
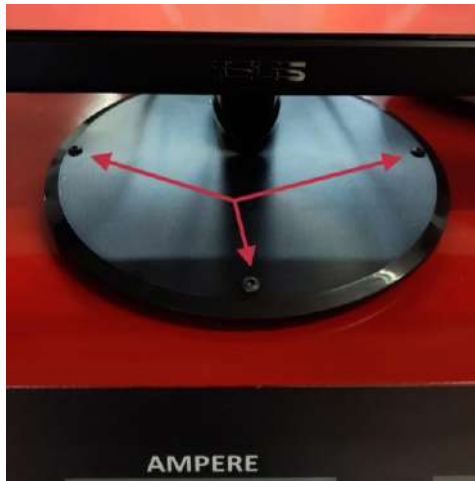
13. Attach the left sensor into the calibration socket on the stand.



14. Attach the right sensor to the torch you want to use.



15. Mount the touch screen on the simulator device and connect the cables.



16. Connect the cable shown below from the simulator to the welding mask.



17. Plug the device into an electrical outlet 220 VAC 50-60 Hz and insert the other plug into the back of the device.

18. Turn on the button on the back of the device.



19. After the energy light on the front of the device turns on, press the on/off button.



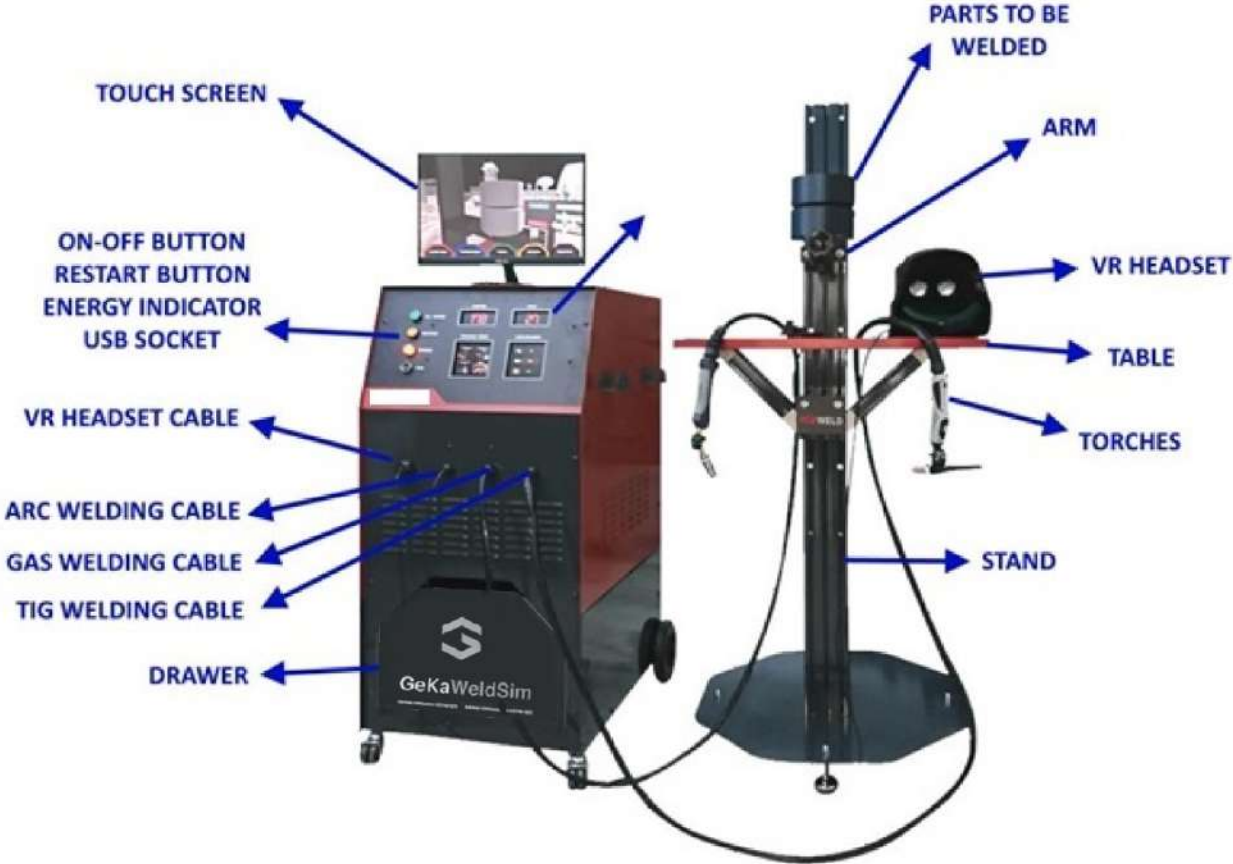
20. After the system is turned on, the simulation will start automatically.
21. When the simulation is opened for the first time, it will give an error that no headset were found. Wait about 5 minutes on this screen, your headset will be charged. Then turn on the headset by pressing the button on the headset for 3 seconds.
22. After the headset are turned on, the first screen of the simulation, the name entry screen, will appear on the screen on the simulator.
23. Enter the welding parameters and set up the simulation with the help of the touch screen.
24. After the last step of the installation, take the torch you will use and put on the welding mask.

25. After the simulation environment is opened, perform automatic calibration by pressing the “Y” key on the left sensor in the calibration socket.



26. After the application is finished, place the torch on the hanging apparatus, place the welding mask into the socket on the table.
27. To use a different torch, you need to attach the right sensor to the torch you want to use. To attach the right sensor to a different torch, pull the sensor backwards and push forward to the torch you want to attach.

Simulator Components:



Simulator Setup Screens:

1.1. Name Entry Screen:

Using the touch screen, enter the user's name, surname and id number and press the next button.



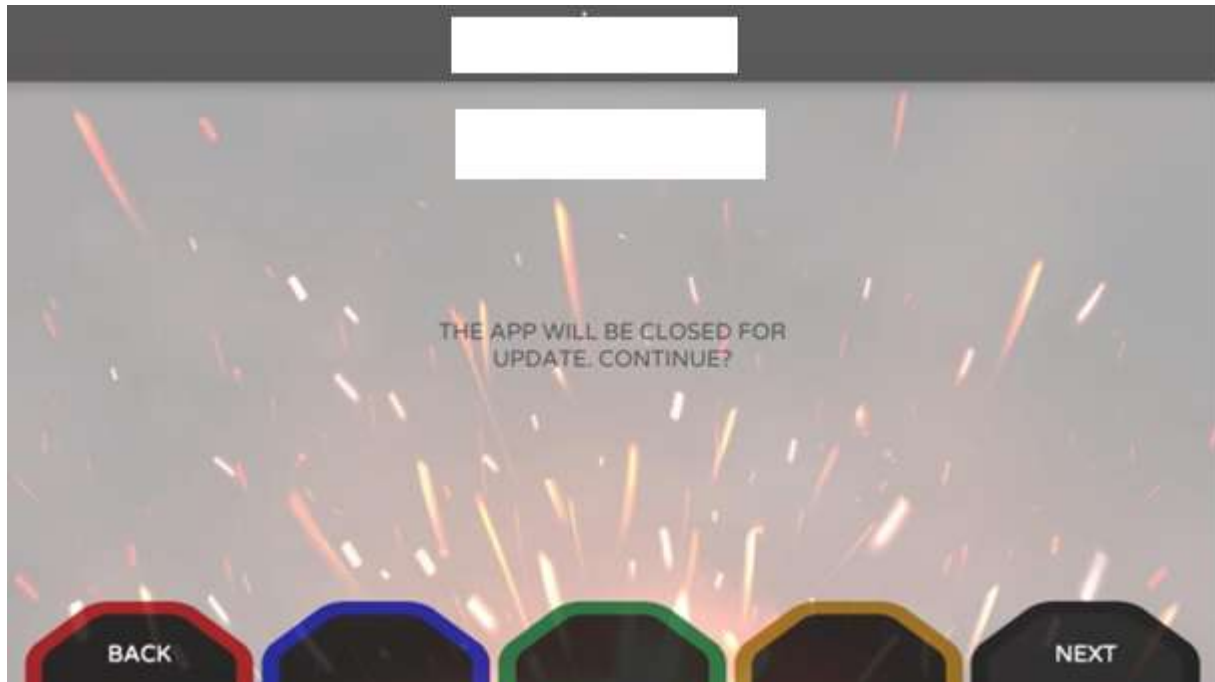
1.2. Saving to USB:

After inserting the USB device into the simulator, select the user whose data you want to send to USB and press the save button.



1.3. Update:

To update the application, plug the update USB device into the USB socket of the simulator and press the next button.



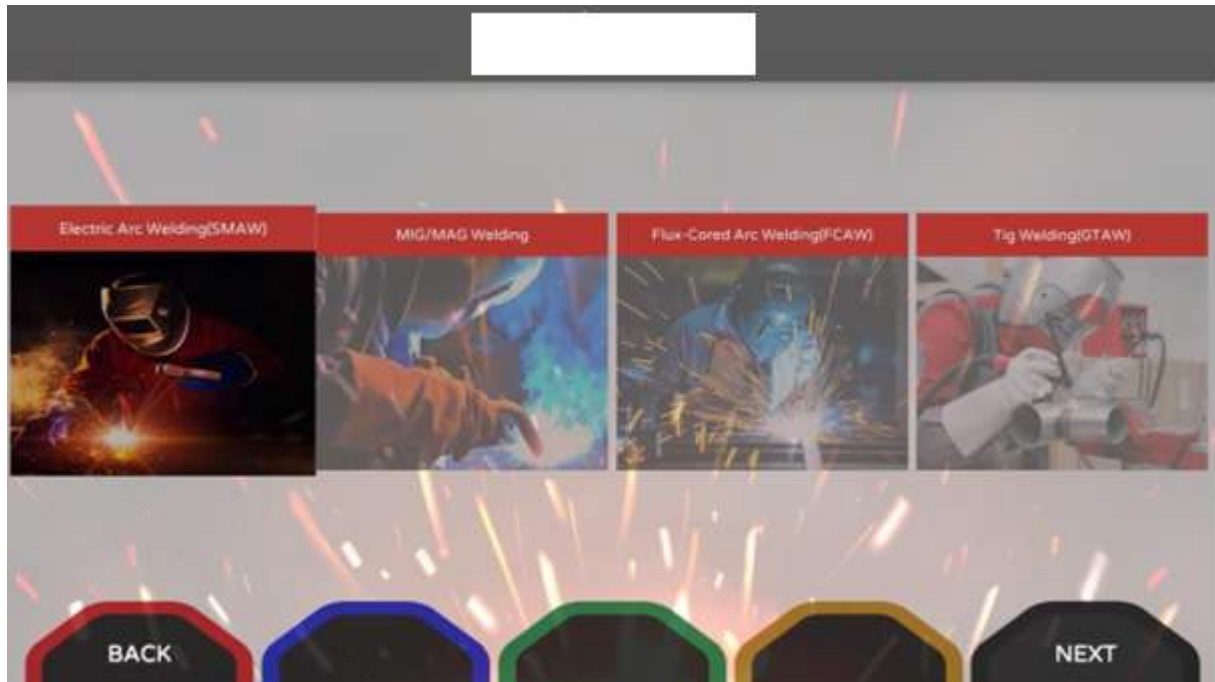
1.4. Part, Material and Thickness Selection:

Select the parts, thickness and material to be welded using the touch screen and press the next button.



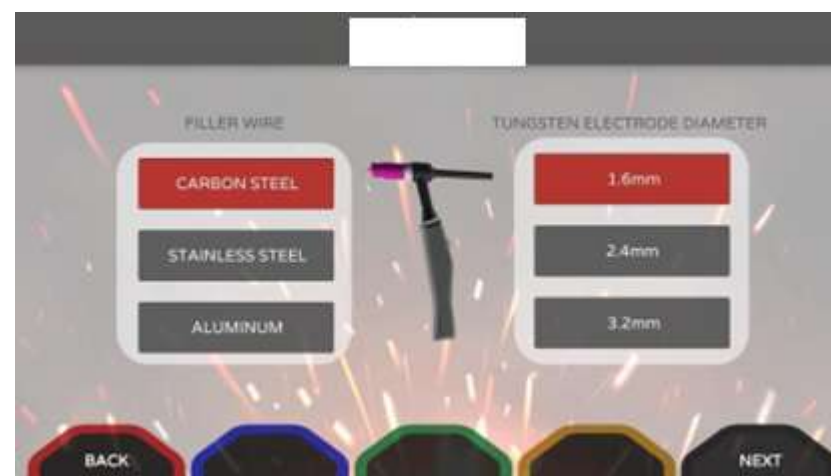
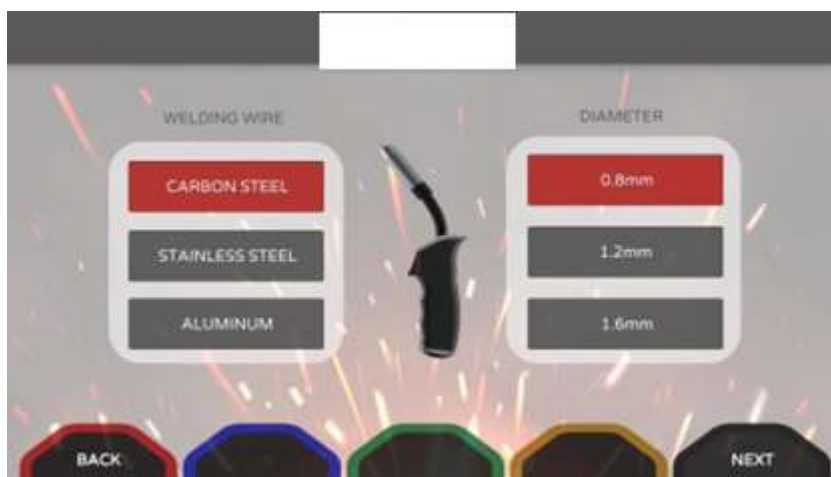
1.5. Welding Method Selection:

Select the desired welding method using the touch screen and press the next button.



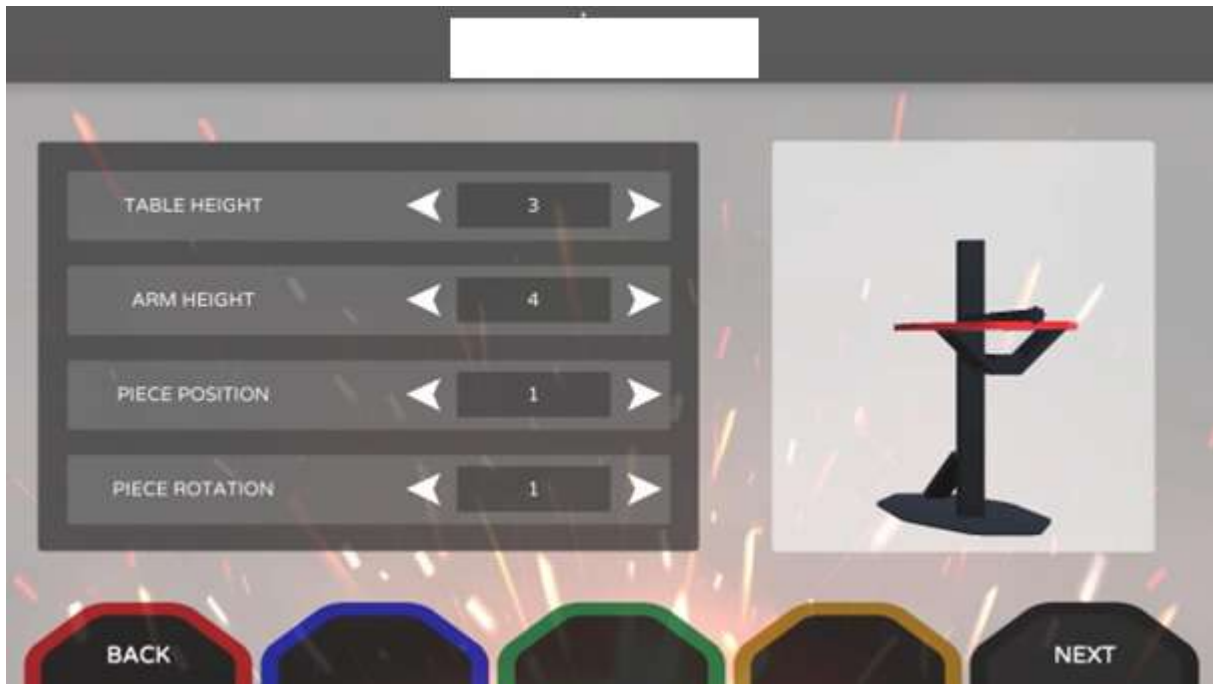
1.6. Electrode / Welding Wire Material and Diameter Selection:

Select the electrode / welding wire material and diameter using the touch screen and press the next button.



1.7. Part, Table and Holder Arm Position Selection:

Using the touch screen, enter the real positions of the part, table and part holder arm into the system and press the next button.



1.8. Welding Area Selection:

Select the environment you want to be in while welding and press the next button.



1.9. Gas Type and Flow Rate:

Select the type of gas using the touch screen and adjust the gas flow.



1.10. Current Type, Ampere and Volt Value Selection:

Select the current type using the touch screen. Determine the ampere and volt values using virtual amperage and voltage adjustable pots.



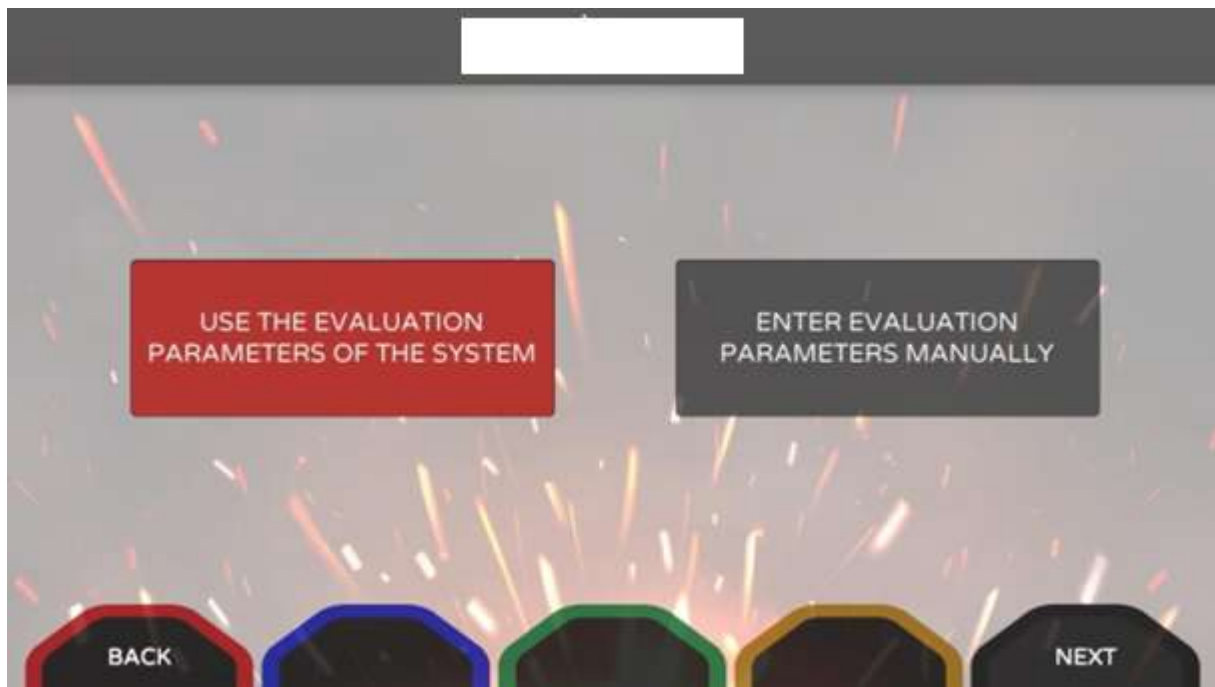
1.11. Welding Technique Information:

Using the touch screen, select which direction to weld, the type of welding technique and which hand you will use, and press the next button.



1.12. Automatic and Manual Welding Parameters Selection:

You can select the welding parameters created by the system according to the entered information, or if you want to change these values, select the manual evaluation parameters entry button and press the next button.



1.13. Analysis Screen:

On the analysis screen, information such as welding parameters, the user's position during welding, arc length, working and travel angles, and travel speed are displayed graphically. Welding defects are indicated as a line in the color of the defect in the regions where the weld is located. Errors made by the user throughout the welding are shown as percentages.



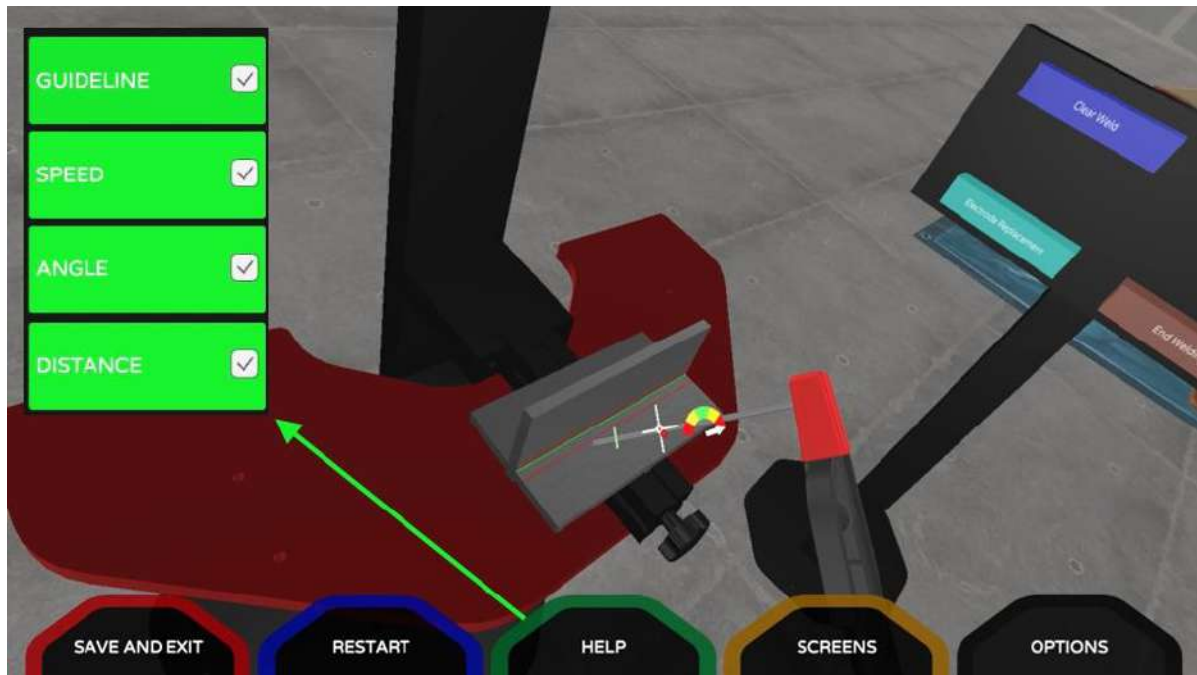
1.14. Screen Selection:

The operations performed by the welding user are displayed on the screen on the device for other users to see. Welding can be viewed from the user's eye on the VR screen, the analysis data can be viewed on the analysis screen, and the operations performed on the piece can be viewed on the part screen.



1.15. Help Selection:

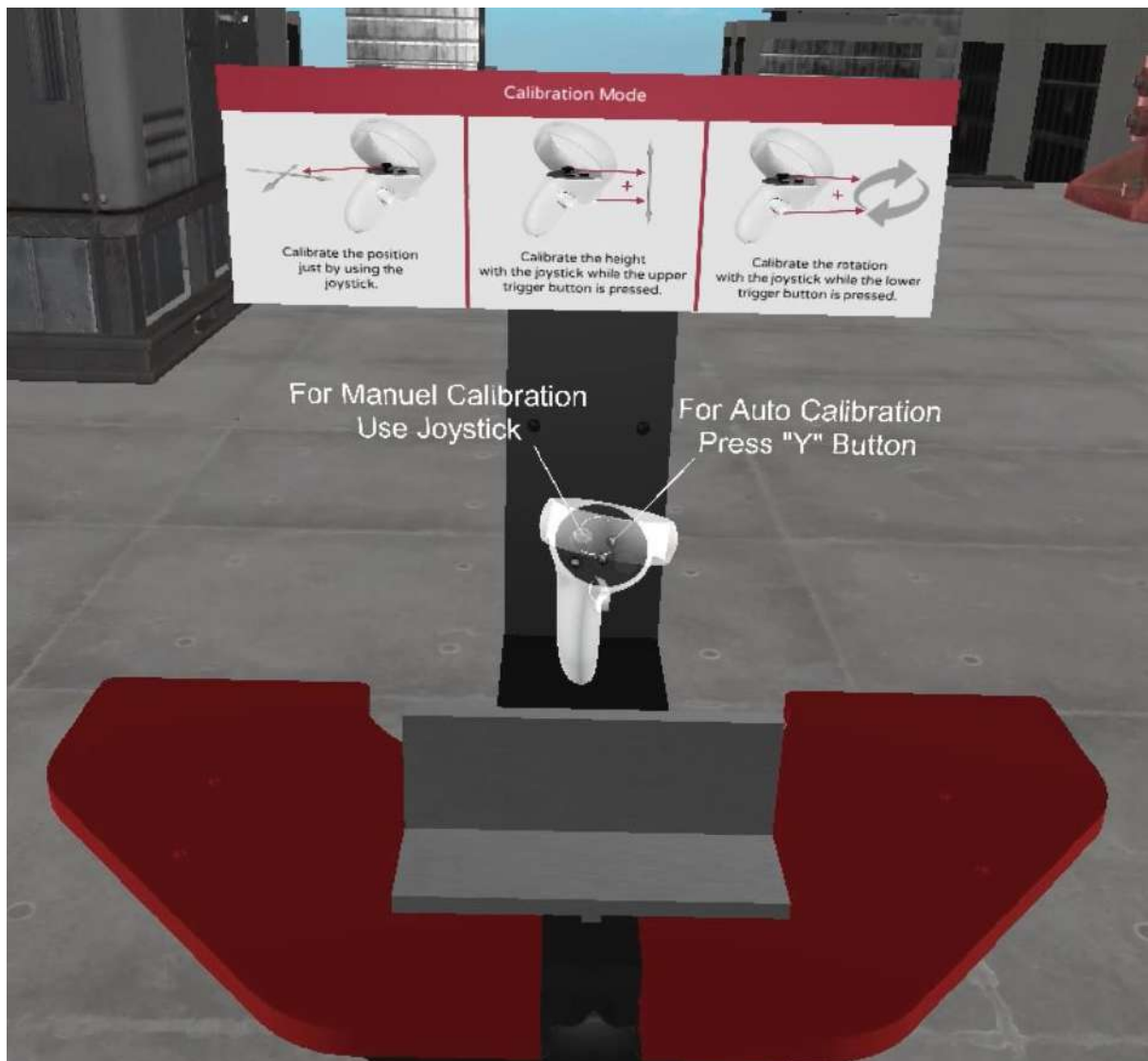
Guideline assist, speed assist, angle assist and distance assist can be turned on to assist the welding user.



1.16. Calibration:

For automatic calibration, press the "Y" button on the sensor that is in the calibration socket.

For manual calibration, use the joystick on the sensor located in the calibration socket. You can move the virtual environment using the joystick

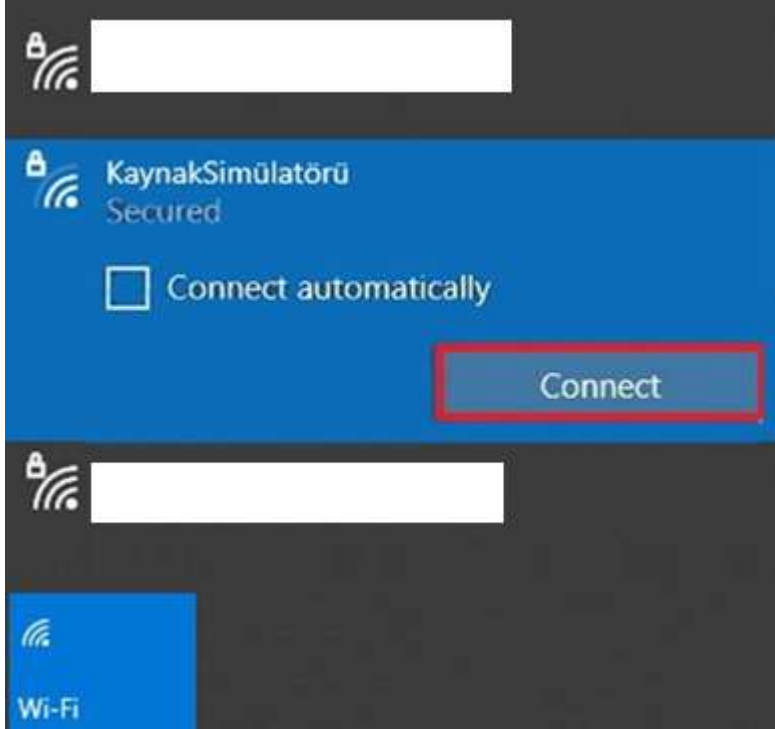


1.17. Teacher Software:

With the teacher software, you can access the application and exam data of the students on the device. You can create questions for the multiple choice exam. You can send a quiz to the user using the device.



Before opening the teacher software, click on your computer's wifi icon and connect to the network named “**KaynakSimülatörü**”. In order to connect to this network, the welding simulator must be open. You can connect to this network with this password:



Thanks to this software, the teacher can access all the data of the welding that the users have made before. The teacher can watch the videos recorded during welding.

NAME	DATE	DATA TYPE
TR789	2022-05-02 02:52:32	EXAM DATA
TR789	2022-05-02 02:50:17	EXAM DATA
TR78	2022-05-02 02:49:26	EXAM DATA
ERTAN	2022-05-03 18:04:24	PRACTICE DATA
DENIS	2022-05-03 15:39:23	PRACTICE DATA
DENIS	2022-05-03 15:38:48	PRACTICE DATA
DENIS	2022-05-03 15:37:55	PRACTICE DATA
DENIS	2022-05-03 15:34:11	PRACTICE DATA
DENIS	2022-05-03 15:33:15	PRACTICE DATA
YALCIN	2022-05-03 15:17:50	PRACTICE DATA
YALCIN	2022-05-03 15:15:43	PRACTICE DATA
YALCIN	2022-05-03 15:11:50	PRACTICE DATA

WELDER NAME: DENIS

WELDED DATE: 2022-05-03 15:38:48

WELD: T-JUNTER CORNER

WELD THICKNESS: 5mm

WELD MATERIAL: CARBON STEEL

WELD TYPE: MIG/MAG WELDING

WELDING TORQUE: CARBON WELDING WIRE(1.5mm)

WELD GAS: 100% ARGON 1/2 CO₂

WELDING WIRE: 16

WELDING TYPE: DC-

WELD WELDING SPEED(mm): 272(A)

WELD: 24

DIRECTION: LEFT TO RIGHT PULLING

WELDING TYPE: STRAIGHT

Para: T-JUNTER CORNER | Thickness: 5mm | Material: CARBON STEEL | Weld: MIG/MAG WELDING | Arg: 1/2A (DC-) | Technic: STRAIGHT
 Electrode/Wire: CARBON WELDING WIRE(1.5mm) | Direction: LEFT TO RIGHT PULLING | Gas Mixture: 100% ARGON 1/2 CO₂ | Gas Flow: 16l/min | Volt: 24 | Contact No: 4099952210001

Position

All Change

Work Angle

Travel Angle

Travel Speed

Travel Coordinates

X Y Z

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Section 1/1

Incomplete Penetration

Gap Inclusion

Undercut

Porosity

Post Bead Placement

Concave

Convex

Wrong Weld Size

Excess Spatter

Multi/No Through

Position

Arg Length

Work Angle

Travel Angle

Travel Speed

Global Score

Minutes (%)

Incomplete Penetration

Gap Inclusion

Undercut

Porosity

Post Bead Placement

Concave

Convex

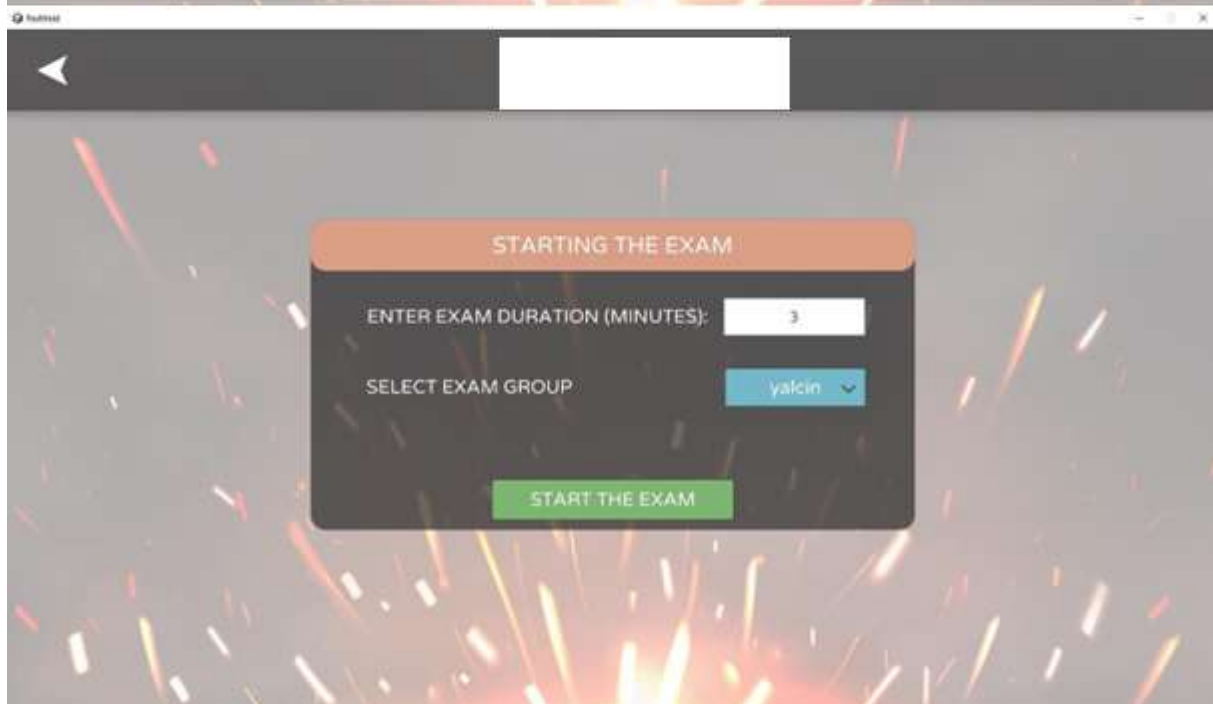
Wrong Weld Size

Excess Spatter

Multi/No Through

WATCH VIDEO **SAVE**

After creating the questions and answers in the question groups section, you can send the exam to the simulator in the exam creation section.



2. APPLICATIONS

2.1. Arc Welding Applications

2.1.1. Rutile Electrode Welding Applications

Optimum welding parameters of electrode manufacturers:

Rutile electrode: e6013 (direct current - , alternative current min. 50V) (horizontal)

Material thickness (mm)	Electrode Diameter (mm)	Ampere (A)	Feed Rate (mm/min)
3-4	2,5	60-80	200-240
5-7	3,2	90-130	200-240
8-10	4	130-170	200-240

2.1.2. Basic Electrode Welding Applications

Optimum welding parameters of electrode manufacturers:

Basic electrode: e7018 (direct current +) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Electrode Diameter (mm)	Ampere (A)	Feed Rate (mm/min)
3-4	2,5	70-90	200-240
5-7	3,2	90-130	200-240
8-10	4	130-170	200-240

2.1.3. Cellulosic Electrode Welding Applications

Optimum welding parameters of electrode manufacturers:

Cellulosic electrode: e6010 (direct current +) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Electrode Diameter (mm)	Ampere (A)	Feed Rate (mm/min)
3-4	2,5	60-80	200-240
5-7	3,2	90-130	200-240
8-10	4	130-170	200-240

2.2. Gas Welding Applications

2.2.1. Welding Applications with Carbon Steel Welding Wire

Optimum welding parameters of welding wire manufacturers:

Carbon steel electrode: (direct current +) (vertical, horizontal, cornice)

Material thickness (mm)	Wire Diameter (mm)	Wire Feed Speed (m/min)	Ampere (A)	Volt (V)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3	0,8	4	70-90	16-18	350-450	%90 argon, %10 co2	8
4	0,8	4,4	80-110	16-20	350-450	%90 argon, %10 co2	8
5	1	5	100-140	18-22	350-450	%90 argon, %10 co2	10
6-7	1	5,4	120-160	20-24	350-450	%90 argon, %10 co2	10
8-9	1,2	6	140-200	22-26	350-450	%90 argon, %10 co2	12
10	1,2	7	180-250	24-28	350-450	%90 argon, %10 co2	12

2.2.2. Welding Applications with Stainless Steel Welding Wire

Optimum welding parameters of welding wire manufacturers:

Stainless steel electrode: (direct current +) (vertical, horizontal, cornice)

Material thickness (mm)	Wire Diameter (mm)	Wire Feed Speed (m/min)	Ampere (A)	Volt (V)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3	0,8	4	60-80	16-18	350-450	%98 argon, %2 co2	8
4	0,8	4,4	70-100	16-20	350-450	%98 argon, %2 co2	8
5	1	5	80-120	18-22	350-450	%98 argon, %2 co2	10
6-7	1	5,4	90-140	20-24	350-450	%98 argon, %2 co2	10
8-9	1,2	6	110-180	22-26	350-450	%98 argon, %2 co2	12
10	1,2	7	150-220	24-28	350-450	%98 argon, %2 co2	12

2.2.3. Welding Applications with Aluminum Welding Wire

Aluminum electrode: (direct current +) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Wire Diameter (mm)	Wire Feed Speed (m/min)	Ampere (A)	Volt (V)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3	0,8	4	90-120	16-18	350-450	%100 argon	8
4	0,8	4,4	100-140	16-20	350-450	%100 argon	8
5	1,2	5	120-170	18-22	350-450	%75 argon, %25 helyum	12
6-7	1,2	5,4	140-200	20-24	350-450	%75 argon, %25 helyum	12
8-9	1,6	6	170-240	22-26	350-450	%75 argon, %25 helyum	16
10	1,6	7	200-280	24-28	350-450	%75 argon, %25 helyum	16

2.3. Core Wire Welding Applications

2.3.1. Rutile Cored Wire Welding Applications

Optimum welding parameters of welding wire manufacturers:

Rutile cored wire: fcw11 (direct current +) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Wire Diameter (mm)	Wire Feed Speed (m/min)	Ampere (A)	Volt (V)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3-4	1,2	7	120-200	22-26	350-450	%100 co2	12
5-6	1,2	8	180-250	24-28	350-450	%100 co2	12
7-8	1,6	9	250-350	26-30	350-450	%100 co2	16
9-10	1,6	9,6	300-400	28-32	350-450	%100 co2	16

2.3.2. Basic Cored Wire Welding Applications

Optimum welding parameters of welding wire manufacturers:

Basic cored wire: fcw30 (direct current +) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Wire Diameter (mm)	Wire Feed Speed (m/min)	Ampere (A)	Volt (V)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3-4	1,2	8	140-220	22-27	350-450	%75 argon, %25 co2	12
5-6	1,2	9	200-280	24-28	350-450	%75 argon, %25 co2	12
7-8	1,6	10	250-350	26-30	350-450	%75 argon, %25 co2	16
9-10	1,6	11	280-400	28-32	350-450	%75 argon, %25 co2	16

2.3.3. Metal Cored Wire Welding Applications

Optimum welding parameters of welding wire manufacturers:

Metal cored wire: fcw21 (direct current +) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Wire Diameter (mm)	Wire Feed Speed (m/min)	Ampere (A)	Volt (V)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3-4	1,2	8	150-220	23-26	350-450	%75 argon, %25 co2	12
5-6	1,2	10	200-300	24-28	350-450	%75 argon, %25 co2	12
6-10	1,6	12	250-400	25-30	350-450	%75 argon, %25 co2	16

2.4. Tig Welding Applications

2.4.1. Welding Applications with Carbon Steel Filler Wire

Optimum welding parameters of electrode manufacturers:

Tungsten electrode. Values for carbon steel filler wire: (DC -) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Elektrod Diameter (mm)	Filler Wire Diameter (mm)	Ampere (A)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
3	1,6	1,6	95-135	400	%100 argon	7
4	1,6	2,4	145-200	300	%100 argon	7
5-6	2,4	3,2	210-260	250	%100 argon	7
7-10	3,2	3,2	240-300	250	%100 argon	9

2.4.2. Welding Applications with Stainless Steel Filler Wire

Optimum welding parameters of electrode manufacturers:

Tungsten Electrode. Values for stainless steel filler wire: (DC -) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Elektrod Diameter (mm)	Filler Wire Diameter (mm)	Ampere (A)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
2	1,6	1,6	80-100	300	%100 argon	6
3	1,6	2,4	120-150	300	%100 argon	6
4-6	2,4	3,2	200-275	300	%100 argon	6
7-10	3,2	3,2	275-375	300	%100 argon	6


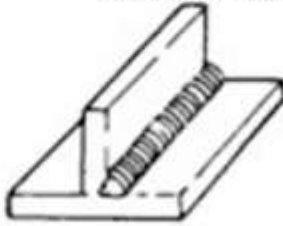
2.4.3. Welding Applications with Aluminum Filler Wire

Optimum welding parameters of electrode manufacturers:

Tungsten electrode. Values for aluminum filler wire: (alternating current) (ceiling, vertical, horizontal, cornice)

Material thickness (mm)	Elektrod Diameter (mm)	Filler Wire Diameter (mm)	Ampere (A)	Feed Rate (mm/min)	Gas	Gas Flow (lt/min)
2	1,6	1,6	60-90	300	%100 argon	7
3	2,4	2,4-3,2	125-160	300	%100 argon	8
4-6	3,2	3,2	190-240	250	%100 argon	10
7-10	3,2	3,2	270-340	250	%100 argon	12

Sample Welding Instruction:

		KAYNAK YÖNTEM SPESİFİKASYONU WELDING PROCEDURE SPECIFICATION			WPS No: CEK-001 WPS No				
Yöntem Testi No: W.P.A.R.No	N/A	Malzeme Spesifikasyonu: Material Specification	EN 10025 S235JR EN 10025 S355JR						
İmalatçı/Manufacturer		Malzeme grubu / Material group ISO 15608' e göre	1.1 - 1.2						
İlgili Standart Applicable Code	EN 15609-1	Kalınlık: Thickness	3mm						
Kaynak Tipi: Joint Type	FW	Kaynak Pozisyonu: Welding Position	PF	<input checked="" type="checkbox"/> Plaka/Plate <input type="checkbox"/> Boru/Tube					
Kaynak Ağızı Hazırlama Metodu /Method of joint preparation	N/A	Dolgu Matali / Filler metal	N/A						
Kaynak Dizaynı / Joint Design			Kaynak Sırası / Welding Sequence						
									
			W Kök pası / root pass F Dolgu pası / filler pass D Kapak pası / cover pass						
Paso Run	Yöntem Process	Dolgu Teli / Filler Metal			Akım Current (A)	Voltaj Voltage (V)	Akım Tipi/Polari te Type of Current/ polarity	Tel Sürme Wire feed (mm/min)	İlerleme Hızı (Travel speed) (mm/min)
		Çap Size	Sınıf/Class (DIN 5575)	Marka Trade Name					
1	MAG	0,80	SG2	N/A	100A	18	DC+	4,3	450
<input checked="" type="checkbox"/> Gas / <input type="checkbox"/> Flux:		<input checked="" type="checkbox"/> shielding <input checked="" type="checkbox"/> backing	%90 argon, %10 co2		Dolgu Metali Ölçüsü / Filler Material Size		N/A		
Gaz Debisi: Gas Flow Rate		<input checked="" type="checkbox"/> shielding <input checked="" type="checkbox"/> backing	12-17 lt/min		Tungsten Elektrod Tipi/Çap: Tungsten Electrode Type/Size		N/A		
Toz / Flux:		N/A		Kaynak Ağızının Hazırlanması: Method of Prep. and Cleaning		N/A			
Ön Isıtma Preheat Temperature		N/A		Diğer Bilgiler: Other Info.		<input type="checkbox"/> Düz/Stringer <input type="checkbox"/> Dalgalı/Weave Paso/Bead			
Pasolar Arası Sıcaklık: Interpass Temperature		N/A							
Kaynak Sonrası Isıl İşlem Post Weld Heat Treatment			Isıtma Hızı Heating rate (°C/h)	Sıcaklık Temperature (°C)	Bekleme Süresi Holding time (min)	Soğutma Hızı Cooling rate (°C/h)			
<input type="checkbox"/> Evet/Yes			<input checked="" type="checkbox"/> Hayır/No						
Hazırlayan / Prepared by:				Onaylayan / Approved by:					
Tarih- İmza / Date/Signature				Tarih- İmza / Date/Signature					

3. MAINTENANCE

Perform the following maintenance procedures on the device at monthly intervals.

1. Wipe the dusty surfaces of the device and the stand with a clean dry cloth.
2. Check that the power cord of the device is not crushed or torn.
3. Check that all apparatus of the device is complete.
4. Connect the device to the socket with the power cable and energize the system. Turn on the system after the energy light comes on. Check if the display, sensors and virtual reality glasses are working.
5. Check torch calibrations.
6. Clean the lenses of the virtual reality glasses with the lens cleaning cloth. Clean the other dusty and dirty parts of the welding mask with a clean dry cloth.
7. Store the welding mask and sensors in the drawer.
8. In case of any unexpected situation in the device, cut off the power of the system and unplug the power cord and contact the authorities.

4. WARNINGS

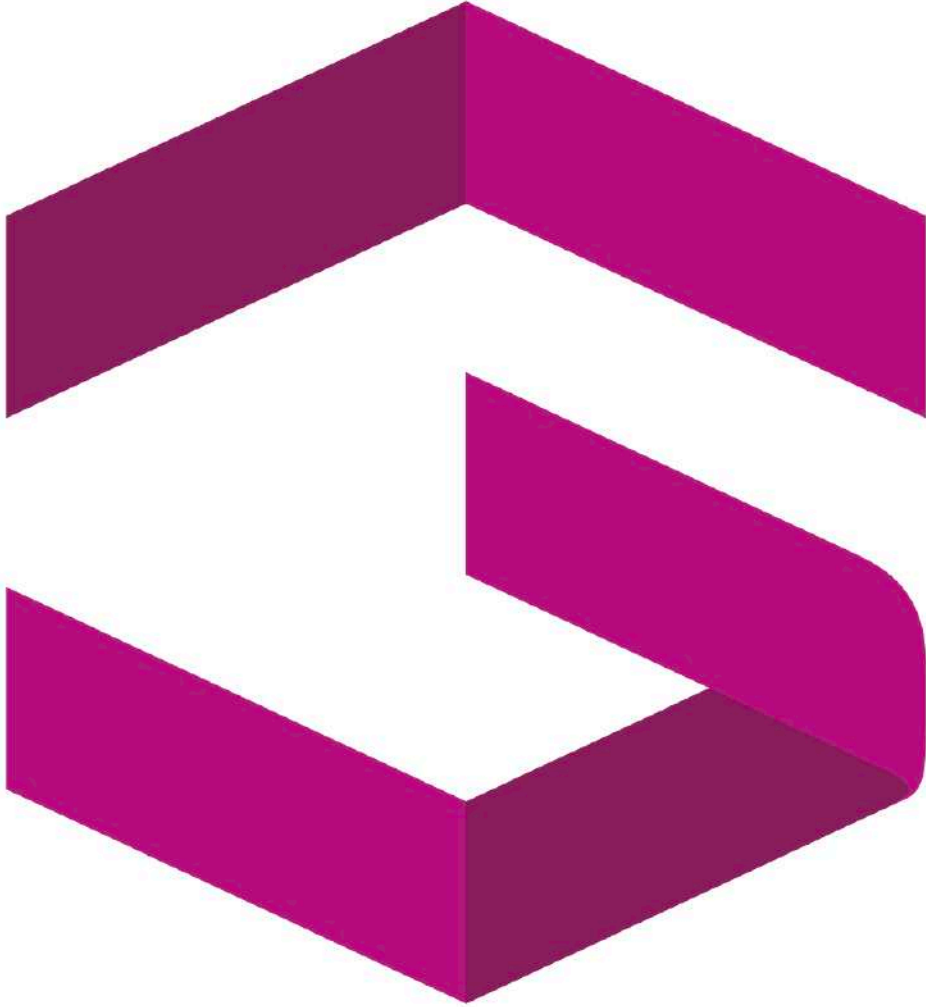
Pay attention to the following warnings when using the device.

1. Protect the virtual reality glasses, sensors and screen from impact.
2. In case of any unexpected situation in the device, cut off the power of the system and unplug the power cord and contact the authorities.
3. Liquid should not be spilled into the device. In such a case, cut off the energy of the system immediately and contact the authorities.
4. After using the device, first turn off the system and after at least 30 seconds, unplug the power cord. Do not unplug the power cord before the system shuts down.
5. Do not leave the power cord of the device in the socket and do not leave the device.
6. Do not leave the power cord in the socket when the device is not in use.
7. If the energy lamp on the front of the device does not light after plugging the device's energy cable into the socket and energizing the system, unplug the system and contact the authorities.
8. Do not leave the cable of the virtual reality glasses and the cables of the torches on the ground after the device is finished. Do not step on cables on the ground.
9. Do not press the on-off and restart buttons of the device more than once in a short time.
10. Make sure that the USB device you will connect to the device is free of viruses or malware.
11. Connect the electricity 220 VAC and 50-60 Hz.

WELDING SIMULATOR



GeKaWeldSim



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