



## **CNC control panel iOP-19-CPU**

### Operating instructions

The information, technical data and dimensions contained within this document represent the latest technical status at the time of publishing. However, the presence of misprints and errors cannot be excluded. We would be grateful for any suggestions for improvements and any information regarding errors.

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**isel Germany AG** machines and controllers are CE-compliant and identified accordingly. Commissioning is forbidden for all other machine parts and components to which the CE safety rules apply, until all of the respective requirements have been fulfilled.



**isel Germany AG** shall be exempted from liability if any alterations are carried out on the controller.



The EMC test applies to the original configuration of the controller as it was when it left the factory.

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Subject to technical alterations.  
Current operating instructions and manuals can be downloaded at:

[www.isel-data.de/manuals](http://www.isel-data.de/manuals)

## Remarks concerning these operating instructions

### Abbreviations used

<b>MRL</b>	<i>Machinery directive 2006/42/EC</i>
<b>ERL</b>	<i>EMC directive 2004/108/EC</i>
<b>NRL</b>	<i>Low voltage directive 2006/95/EC</i>

### Symbols used

Various symbols are used in these instructions to inform you of important information / matters and to bring hazards to your attention:

**Warning!**

Warning of hazards that could result in health impairments, bodily injuries or death.

**Warning! Life-threatening voltage**

Warning of hazard due to electrical energy. Disregard can result in serious or fatal injuries.

**Attention!**

This symbol identifies instructions which could result in damage or malfunctions if disregarded.

**Information:**

This symbol identifies important information and instructions.

### Observe the safety instructions



*Before commissioning the control panel with control computer iOP-19-CPU, working with the machine or carrying out expansions or alterations to the electrical installation of the machine / machine housing, ensure that you have read the safety instructions in these operating instructions carefully.*

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## 1 General note

**Read the operating instructions carefully through to the end and follow the instructions given.** Disregard of these operating instructions can result in damage to property, serious bodily injury or death.

### 1.1 Safety instructions



- The CNC control panel iOP-19-CPU has been constructed in accordance with the current state of the art and accepted safety rules.
- The device may only be operated when in technically flawless condition. Faults must be rectified immediately. Children and untrained persons are not permitted to start up the device.
- The device must only be used for its intended purpose: Operating, controlling and display device for CNC processing machines from isel Germany AG.
- All work must be carried out exclusively by authorised specialist personnel and whilst taking the regulations of the electrical industry and the accident prevention regulations into account. The mains plug must be pulled out before opening the housing and before any work on the electrical equipment.
- Ensure there is adequate air circulation in the immediate vicinity of the monitor. Ensure that the device is firmly and securely mounted and ensure that the ventilation openings and the supply air openings on the monitor housing are not covered or sealed.
- Mounting and use of operating equipment must be carried out in accordance with the standards in the declaration of conformity. The regulations and limit values that the manufacturer has complied with will not protect against improper use of the operating equipment.
- The device must not be exposed to high levels of humidity or vibration.
- Retain these operating instructions carefully and ensure that all users comply with them!

## 2 Product description

### 2.1 Types

Type	Description	Art. no.
<i>iOP-19-CPU</i>	Without keyboard, RAL 3011	371101 1000
<i>German keyboard, (optional)</i>	Silicone keyboard, RAL 3011	371200 0001
<i>English keyboard, (optional)</i>	Silicone keyboard, RAL 3011	371200 0002

#### 2.1.1 CNC control panel iOP-19-CPU with 19" touch screen

##### Standard



- Robust aluminium housing
- Aluminium front panel finished in stainless steel effect
- Simple mounting via VESA mount 100/100
- Integrated machine controls
- 19" TFT with touch screen
- Resolution max. 1280 x 1024 pixel
- 3 USB connections
- Integrated connection cable compatible with isel CNC machines

##### Optional

- Mounting feet
- Swivel arm for fastening to PS profile
- Single keyboard and mouse drawer
- High quality attachment keyboard made from silicone, 105 keys in German and English, with touch-pad
- Two-hand operation
- Override potentiometer
- Available in three colours

## 2.2 Description of the controls

The most important controls (button, switches) are integrated into the CNC control panel as standard.



No.	Element	Description
1	Power ON button	Switches on the power supply for the output stages.
2	Fault indicator	The fault indicator signals a fault in the safety circuit.
3	Stop button	Interrupts the processing of the current NC program. If the stop button is pressed again the processing is cancelled (does not apply to all controller configurations - only with the signalling set in ProNC).
4	Start button	Starts the processing of the current NC program or has the effect of continuing with an interrupted processing sequence.
5	ACK (acknowledge) button	This button must be pressed to allow axles to be driven in test mode with the hood open.
6	Cover button	This button is used to open the hood (if present). The opening of the hood is then only possible if the conditions described under "Operating mode selector switch" are fulfilled. The release to open the hood is signalled by the button illuminating in white
7	Operating mode selector switch	This key switch is used to change between automatic mode and test mode. In automatic mode the hood or door of the machine can only be opened if the axles are not moving and if the milling spindle connected is switched off. In test mode the hood or door of the machine can only be opened if the working spindle is switched off. In this operating mode the axles can also be moved whilst the hood is open if the ACK acknowledge button is pressed at the same time.
8	EMERGENCY stop button	Switches off the electrical power supply for the motor output stages, inverter and the working spindle.

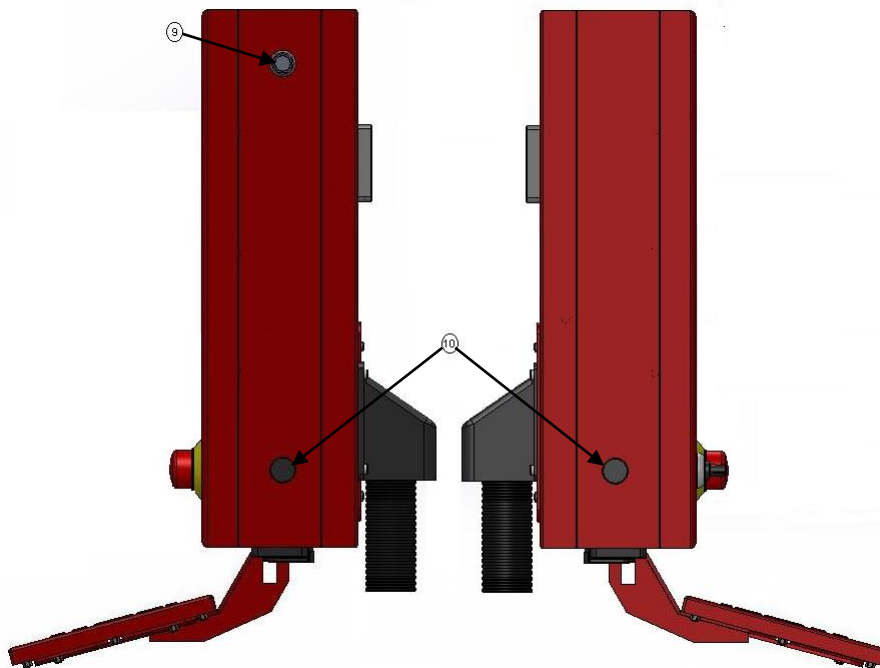


***When changing the mode AUTO->TEST whilst the workpiece is being machined, the machining spindle runs down. Upon changing back to AUTO mode, the machining spindle starts to run again. This can result in damage to the machining spindle or to the workpiece if the change of operating mode is not carried out with the movement axles at a standstill.***



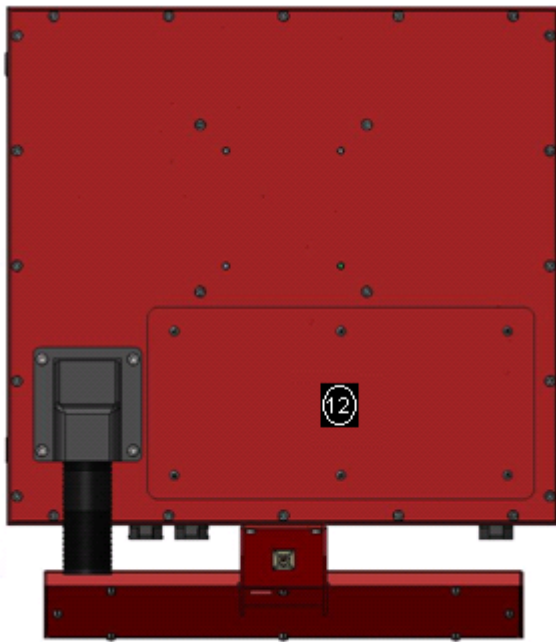
*Controls for the control computer*

No.	Element	Description
9	PC start button	Switches the computer on/off.
10	Two-hand operation	Control buttons for two-hand operation (optional)
11	USB	USB connection for USB device
12	Maintenance opening	Maintenance opening for control computer - access to the connections for computer and controls.
13	Override potentiometer	Potentiometer for override (optional)
14	LAN	1Gbit Ethernet network connection



No.	Element	Description
11	USB connections	The integrated USB hub serves to connect the integrated touch screen. The three USB ports serve to connect USB devices such as USB sticks, WIBU dongles, external CD ROM drives etc.

*Maintenance opening*



### 3 Connection of the controls

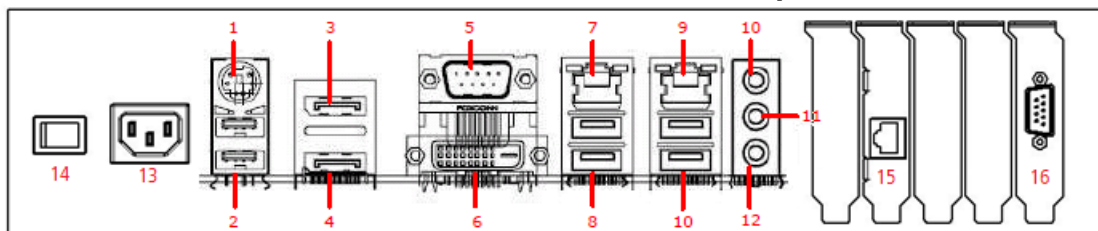


*All connection cables for the CNC control panel are optimised for use with isel controllers. The connection cables must not be extended as the optimum operation of the CNC control panel would no longer be guaranteed after this.*



**Ensure that there is a secure protective earth connection of at least 2.5mm<sup>2</sup> (protected installation) or 4mm<sup>2</sup> (unprotected installation) of copper between the terminal  $\perp$  on the iOP-19 and the protective earth connection on the machine!**

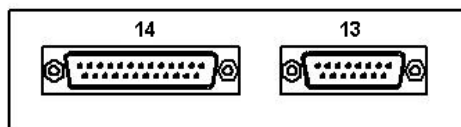
### 3.1 Connection of the controls for the control computer



\*Subject to technical alterations.

No.	Element	Description
1	PS2-port	Connection socket for a PS2 keyboard or PS2 mouse
2	USB port	USB 2.0 ports (for example mouse, keyboard, USB stick)
3	Display Port 1	Connection socket Display Port 1
4	Display Port 2	Connection socket Display Port
5	COM Port 1	2RS232 SubD9 connector for serial transmission
6	DVI-D	Connection socket DVI-Digital
7	LAN 1	Gbit network connection, Ethernet
8	2x USB 3.0 port	2 x USB 3.0 connection sockets
9	LAN 2	Gbit network connection, Ethernet
10	2x USB 3.0 port	2 x USB 3.0 connection sockets
11	Audio-Line-In (blue)	Audio input external devices
12	Audio-Line-Out (yellow)	Audio output headphones
13	Audio-Microphone (pink)	Microphone socket
13	Power supply ~ 230V	Power connector for the PC
14	Power switch	Switch for PC and monitor
11	CAN PCIe card	isel-CAN-Interface iCCE10
12	COM2 port (option)	RS232 SubD9 connector for serial transmission

### 3.2 Connection of the machine controls



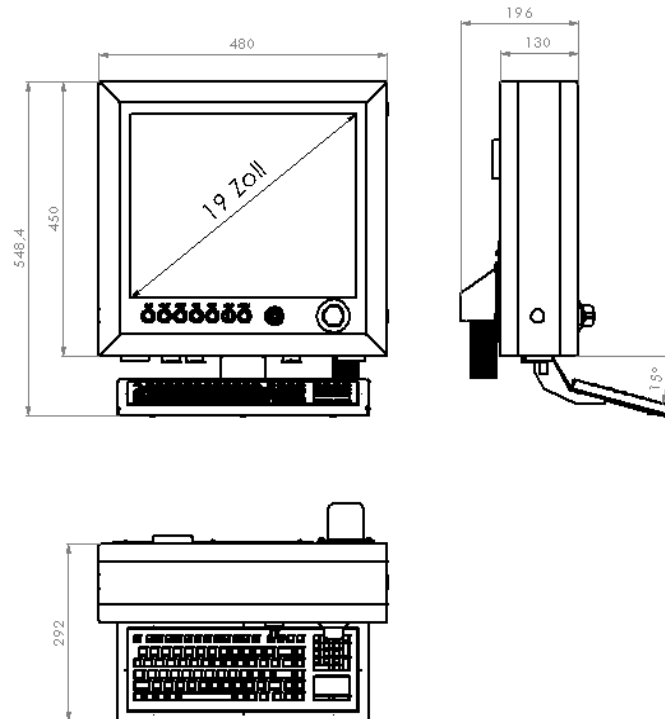
No.	Description
13	<p><b>Connection for additional console - SubD15-pole plug</b>                      An additional portable operating console can be attached to this connection. If no operating console is connected then the bridging plug supplied (pin1/pin2 and pin3/pin4 bridged) should be inserted. However, not all functionalities that are available with the integrated operating console in the front of the housing, can be used.</p>
14	<p><b>Control element SubD25-pole, socket</b>                      The control elements (buttons, switches) in the front of the housing of the CNC control panel can be connected to the safety circuit module of the controller in the switch cabinet via this connection. To do so, the connection cable with the SubD25 plug must be connected to the SubD25 socket. With machines and systems with integrated control in the switch cabinet, this connection cable comes directly from the safety circuit module.</p>

#### SubD25-pole pin assignment

Pin	Signal	Designation
1	EMERGENCY STOP_1	EMERGENCY stop channel 1, connection 1.1
2	EMERGENCY STOP_1	EMERGENCY stop channel 1, connection 1.2
3	EMERGENCY STOP_2	EMERGENCY stop channel 2, connection 2.1
4	EMERGENCY STOP_2	EMERGENCY stop channel 2, connection 2.2
5	24V	+24 V DC
6	POWER BTN	Input power button
7	POWER LAMP	Output power lamp
8	24V	+24VDC
9	KEY SWITCH test	Input key switch test mode
10	KEY SWITCH auto	Input key switch automatic mode
11	24V	+24VDC
12	ACK_1	Input acknowledge button, channel 1
13	24V	+24VDC
14	ACK_2	Input acknowledge button, channel 2
15	COVER SWITCH	Input cover button
16	COVER SWITCH	Output cover button
17	GND	
18		
19		
20	FAULT LAMP	Output operating console fault lamp
21	START BTN	Input start button (NO contact)
22	STOP BTN	Input stop button (NC contact)
23	START LAMP	Output start lamp
24	STOP LAMP	Output stop lamp
25	Not connected	

## 4 Technical data

### Dimensional drawing



### 4.1 Control computer technical data

Component	Description
Mainboard	mATX-Mainboard <ul style="list-style-type: none"> <li>- 1 x PCI Express x16</li> <li>- 1 x PCI Express x 4</li> <li>- 2 x PCI Express x 1</li> <li>- 1 x Full/Half Mini PCI Express</li> <li>- 4 x DDR4 Slots (maximal 8 GB per slot)</li> <li>- 2 x Gbit LAN</li> <li>- 2 x USB 2.0</li> <li>- 4 x USB 3.0</li> <li>- Audio ports</li> <li>- 1 x PS2-keyboard/PS2-mouse</li> <li>- DVI-D</li> <li>- 2 x Display Port</li> <li>- 1 x COM Port RS232</li> </ul>
CPU	Intel Core i5 $\geq$ 2.8 GHz
RAM	DDR4-RAM $\geq$ 8 GB
Hard drive	Capacity $\geq$ 256GB, SSD 2.5"

## 4.2 Monitor technical data

Characteristics	
Driver	19" TFT Active Matrix
Viewing angle	75°(horizontal) 60°(vertical.)
Pixel size	0.264(H) x 0.264(W)
Visible surface	337 x 270 mm
Max. pixel count	1280 x 1024
Colours	24-Bit colour depth 16.2 mil.

## 4.3 General technical data

Characteristics	
Connections	3x USB 2.0 (fed out) 1x RJ 45, Ethernet 1Gbit
Protection	iOP-19-CPU IP 40 Keyboard IP 68
Environmental temperature	5°C – 35°C
Storage temperature	-25°C – 55°C
Weight	approx. 16 kg
Electrical power supply	115V - 230V AC; 50/60 Hz; 3.5A – 7A

## 5 Restoring the operating system Windows® Embedded Standard 7

### Important information



- 1.) To restore (recover) the operating system, Windows® Embedded Standard 7, on your control computer, you will need the USB recovery stick provided. This data carrier contains an image of the operating system for your integrated control computer in its delivery condition.
- 2.) The hard drive of the control computer delivered was sub-divided at the factory into two separate partitions. The primary partition (ca. 40 GB) of the hard drive contains the operating system, Windows® Embedded Standard 7, whilst the second partition is available for operator use.
- 3.) If you have partitioned the hard drive differently from how it was delivered, this will be reset back to delivery condition with the restoration. i.e. the partitions described in 2.) will be restored.

### 5.1 Preparations for restoring the operating system

#### *Back up user data*



- 1.) Back up your user data from all partitions to an external data carrier (USB stick, USB HDD).
- 2.) If you have made changes to your software configuration on the controller since delivery, back up your current controller configuration with the CNCwbBackup assistant. You can find this under the CNCworkbench entry in the start menu. Save this back-up on an external data carrier!



***The back-up must be implemented onto an external data carrier as all partitions will be formatted when the operating system is restored and so all data will otherwise be lost.***

#### *Preparing for the USB boot*



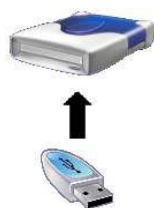
- 1.) After you have backed up all data, the operating system must be booted with the USB recovery stick provided. Insert the USB stick into a free USB connection on the computer. Now switch the computer on and press the <F11> key at the start of the boot process.  
→ The computer's boot menu will be displayed.
- 2.) Use the <up/down arrow> keys to select the USB stick in the list. Confirm your selection with the <ENTER> key.
- 3.) If you have set everything correctly, the operating system on the USB stick should now be booted in place of the operating system installed on the computer's hard drive.



***Alternatively, you can call up the computer's BIOS by pressing the <F2> key whilst the system is starting. There you must change the boot sequence to set the USB recovery stick as the first boot medium. After saving the settings the operating system on the recovery stick will now be started.***



## 5.2 Carrying out system recovery



- 1.) Restart the computer after setting the boot medium or the boot sequence.
- 2.) If the system boots from the USB stick, a blue cube will be seen on the screen with a rotating circle underneath it.
- 3.) After loading the operating system, the command line starts and then the Windows® Embedded Standard 7 Recovery Assistant.
- 4.) Now follow the instructions from the Assistant. Click the "Install" button in the last window to start the recovery. After the successful recovery an assistant window will appear. Confirm with OK!
- 5.) Remove the USB stick (recovery stick).
- 6.) Now enter the command <Exit> in the command line window which is still open, in order to close the window. The computer will now restart.

## 6 Maintenance and repair

### Maintenance

The iOP-19-CPU CNC control panels are maintenance-free.

### Cleaning



Switch off the control computer connected to the CNC control panel along with any other connected components. Disconnect the power supply.



Use a damp, soft cloth for the cleaning. Do not use any cleaning agents or scouring agents. This will result in scratches on the surface of the screen. Ensure that no moisture is able to enter the interior of the housing through the ventilation slots.

### Cleaning the external fan



Switch off the control computer connected to the CNC control panel along with any other connected components. Disconnect the power supply. Then you can clean the external fan with a damp, soft cloth.





## 7 Faults

Fault	Remedial measure
No picture appears on the monitor	<ol style="list-style-type: none"> <li>1 Check whether the control computer connected is switched on.</li> <li>2 Check the wiring of the PC start button and whether the computer connected is switched on.</li> <li>3 Check power supply (Sub-D9-pole plug to iPC)</li> <li>4 Check POWER ON indicator light. If necessary switch on the monitor via the Power on/off button</li> <li>5 A resolution that the monitor is not able to display has been selected. Reset the resolution by starting the computer in Safe Mode and then changing the screen resolution.</li> </ol>
The screen image is distorted	<ol style="list-style-type: none"> <li>1 Carry out an auto-calibration of the monitor via the appropriate button</li> </ol>
The system cannot be controlled via the controls	<ol style="list-style-type: none"> <li>1 Check the connection of the cable (SubD25 plug) to the safety circuit module.</li> <li>2 Check the settings for signalling in the software (affects: start/stop button)</li> </ol>
Integrated touch screen and the keyboard not functioning	<ol style="list-style-type: none"> <li>1 Check whether the power supply for the integrated USB hub is connected. The power supply is provided to the safety circuit module via the machine controls cable (SubD25 plug).</li> <li>2 Check whether the USB cable is correctly connected to the control computer.</li> </ol>

## 8 EC - Declaration of Conformity

### EG-Konformitätserklärung



Der Hersteller

*The manufacturer*

**isel Germany AG**  
**Bürgermeister-Ebert-Str. 40**  
**D-36124 Eichenzell**

erklärt hiermit, dass folgendes Produkt  
*hereby declares that the following product*

**Geräteart:** **CNC-Bedienpanel iOP-19-CPU**  
*Device:* CNC-Control-Panel iOP-19-CPU  
**Typ:** **iOP-19-CPU**  
*Type:*  
**Art.-Nr.:** 371103 1000  
*Product - No.:*

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:  
*complies with the requirements of the European Directives:*

EG-Richtlinie 2004/108/EG <i>EC-Directive 2004/108/EC</i>	EMV Richtlinie <i>EMC directive</i>
EG-Richtlinie 2006/95/EG <i>EC-Directive 2006/95/EC</i>	Niederspannungsrichtlinie <i>low voltage directive</i>

Folgende harmonisierte Normen wurden angewandt:  
*Following harmonized standards have been applied:*

EN 61000-6-2:2006	EMV - Fachgrundnorm - Störfestigkeit für Industriebereich <i>EMC - Generic standards - Immunity for industrial environments</i>
EN 61000-4-2:2008	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen Entladung statischer Elektrizität (ESD) <i>EMC - Testing and measurement techniques; Electrostatic discharge immunity test</i>
EN 61000-4-4:2012	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen schnelle transiente elektrische Störgrößen (Burst) <i>EMC - Testing and measurement techniques - Electrical fast transient/burst immunity test</i>
EN 61000-4-5:2007	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen energiereiche Impulse (Surge) <i>EMC - Testing and measurement techniques - Surge immunity test</i>
EN 61000-4-11:2005	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen Spannungseinbrüche / Spannungsunterbrechungen <i>EMC - Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests</i>
EN 61000-6-4:2011	EMV - Fachgrundnorm - Störaussendung Industriebereich <i>EMC - Generic standards - Emission standard for industrial environments</i>
DIN EN 55011:2011	Industrielle, wissenschaftliche und medizinische Hochfrequenzgeräte (ISM-Geräte) - Funkstörungen - Grenzwerte und Messverfahren <i>Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement</i>

Dermbach, 06.02.2019

Werner Kister, Vorstand / managing board