

# AMC6 CNC - User Manual

AMDOC-000549 Rev 04



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# AMC6 CNC - User Manual

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Document Reference: AMDOC-000549 Rev 04

Effective: 06-12-2023

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# **1** Introduction

### **1.1 Using this Manual**



**Note:** The information within this document is intended for trained specialists in the control and automation industry. It is important that the information must be followed carefully when installing or using this product.

This manual is a guide to describe the installation and operation of AMC6 CNC. It has been written specifically to meet the needs of ANCA's OEM clients, tradespeople, technicians and daily operators. It is important that the information must be followed carefully when installing or operating this CNC. This device may only be used within the operating boundaries described in the 5.1 *Product Specifications* section of this document. It is the operators' responsibility for this device to ensure that all relevant national and local safety standards, regulations and laws are followed when installing and operating this device.

The details given in the manual are organised in the following way:

- Product Overview
- Installation and Operation
- Troubleshooting
- Product Specifications
- Certificates and Approvals
- Additional Information

# **1.2 Related Documents**

D-000108\_CNC PMK Compatibility Guide.pdf

# **1.3 Terms and Abbreviations**

AMC6	ANCA Motion Controller 6		
ANCA	Australian Numerical Control and Automation		
AT Mode	Advanced Technology – an early defacto-standard for personal computer motherboard and power supply form-factor		
ATX Mode	Advanced Technology eXtended – the current defacto-standard for personal computer motherboard and power supply form-factor		
BIOS	Basic Input Output Subsystem		
CE	Conformance European – a CE mark is placed on commercial products to state conformance with European Union regulations regarding safety, health and environmental requirements		
CNC	Computer Numerical Control		
COM Port	A serial communications interface using a choice of protocols RS-232 (default), RS-422 or RS-485		
CMOS	Complementary Metal Oxide Semiconductor		
DC	Direct Current		
EMC	Electromagnetic Compatibility		
EtherCAT	Ethernet for Control Automation Technology		
Ethernet	Network Protocol		
FCC	Federal Communication Commission		
HDD	Hard Disk Drive		
I/O	Input / Output		
IP rating	Ingress Protection rating		
GB	Giga-Byte		
GHz	Giga-Hertz		
HDMI	High-Definition Multimedia Interface		
LAN	Local Area Network		
LCD	Liquid Crystal Display		
LED	Light Emitting Diode		
LVD	Low Voltage Directive		
Mbps	Megabits per second (1 million bits per second)		
NC	No Connection		
PMK	Platform Maintenance Kit		
RAM	Random-Access Memory		
SSD	Solid-State Drive		
USB	Universal Serial Bus		
UKCA	UK Conformity Assessed		
VDC	Units for DC voltage		
VGA	Video Graphics Array – an analogue video standard		

#### **Table 1 Terms and Abbreviations**

### **1.4 Trademarks**

 $\label{eq:charge} \mbox{EtherCAT} \mbox{$\mathbb{B}$ is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.}$ 

# 2 Product Overview

### 2.1 Part Number Overview

### 2.1.1 Part Number Interpretation

AMC6 CNCs are marked with an identification label, and the part number interpretation is shown below.





### 2.1.2 CNC Part Number and Hardware Part Number Mapping

The CNC included in the ordering package has a hardware part number that was programmed in the BIOS which will be displayed on the software interface. To identify the CNC from the software interface, please use this table below:

Description	Part Number	Hardware Part Number in BIOS
AMC6 CNC ATX	AMC6-HA332-1E00	946-0-03-1200
AMC6 CNC AT	AMC6-HA333-1E00	946-1-03-1200
AMC6 CNC i5 2.2GHz 256GB SSD 8GB RAM ATX	AMC6-HA532-1E00	946-2-03-1200
AMC6 CNC i5 2.2GHz 256GB SSD 8GB RAM AT	AMC6-HA533-1E00	946-3-03-1200
AMC6 CNC i5 2.2GHz 512GB SSD 8GB RAM ATX	AMC6-HA632-1E00	946-4-03-1200
AMC6 CNC i5 2.2GHz 512GB SSD 8GB RAM AT	AMC6-HA633-1E00	946-5-03-1200

#### Table 2 Part Number Mapping Table

# 2.2 Variant Identification

The AMC6 CNC is industrial PCs which has been designed for control systems applications. The chassis of the CNC has been designed for the CNC to be installed in protected environments.



#### **Table 3 CNC Variant**

The AMC6 CNC consists of:

- ✓ Industrial PC with an Intel 9<sup>th</sup> Gen Core i5 processor
- ✓ 8 GB system memory
- ✓ AT/ATX power mode
- ✓ 64/256/512 GB SSD
- ✓ 1 x EtherCAT and 1 x Ethernet port
- ✓ 4 x USB2.0 and 4 x USB3.0
- ✓ 1 x VGA connection via 15 pin female D-SUB connector
- ✓ 1 x HDMI port
- ✓ 2 x Audio (1 x line out and 1 x mic in)
- ✓ 2 x Serial COM port



Note: The AT/ATX power mode behavior is programmed by different BIOS firmware.

# 2.3 Ordering Information

### 2.3.1 Product Ordering Information

Description	Part Number
AMC6 CNC ATX	AMC6-HA332-1E00
AMC6 CNC AT	AMC6-HA333-1E00
AMC6 CNC i5 2.2GHz 256GB SSD 8GB RAM ATX	AMC6-HA532-1E00
AMC6 CNC i5 2.2GHz 256GB SSD 8GB RAM AT	AMC6-HA533-1E00
AMC6 CNC i5 2.2GHz 512GB SSD 8GB RAM ATX	AMC6-HA632-1E00
AMC6 CNC i5 2.2GHz 512GB SSD 8GB RAM AT	AMC6-HA633-1E00

#### Table 4 Product Ordering

### 2.3.2 Accessories

This section contains summarised information on accessories available for the AMC6 CNC as below:

Description	Part Number
PLATFORM MAINTENANCE KIT 10	963-X-XX-0054
KIT CABLE CONNECTION VIDEO HDMI-HDMI 5 METRES (Copper HDMI Cable)	619-0-00-1933
KIT CABLE CONNECTION VIDEO HDMI-HDMI 10 METRES (Hybrid Fiber Optic/Copper HDMI Cable)	619-0-00-2233
KIT CABLE CONNECTION VIDEO HDMI-HDMI 15 METRES (Hybrid Fiber Optic/Copper HDMI Cable)	619-0-00-2234
KIT CABLE CONNECTION VIDEO HDMI-HDMI 20 METRES (Hybrid Fibre Optic/Copper HDMI Cable)	619-0-00-1934
4W PLUGABLE TERMINAL BLOCK	ICN-3077-2105
2W PLUGABLE TERMINAL BLOCK	ICN-3077-2108

#### Table 5 Accessories



Note: For part number 963-X-XX-0054 please refer to **D-000108\_CNC PMK Compatibility Guide.pdf** document for recommended version.

### 2.3.3 Packing List

Before you begin installing your card, please make sure that the following items have been shipped:

Description	Quantity
AMC6 CNC	1
PLATFORM MAINTENANCE KIT 10	1
4W PLUGABLE TERMINAL BLOCK	1
2W PLUGABLE TERMINAL BLOCK <sup>(Note 2)</sup>	1
MOUNTING BRACKET	2
MOUNTING M4 SCREW	4

# **i**

Note:

#### **Table 6 Packing List**

- 1. HDMI video cable is not included, and the required length cable must be ordered seperately according to *Table 5 Accessories*.
- 2. The 2W plugable terminal block is only applicable to ATX variants.

## 2.4 Liability Conditions

It is the responsibility of the CNC product users to meet all relevant national and local safety standards, regulations and laws when installing and operating this product.



#### Warning:

- 1. Product warranty will be invalidated if the tamper-evident label or license sticker is broken or removed.
- 2. All components of this product are selected and tested to be compatible with Core CNC software; the product warranty will be invalidated if any component is changed without prior agreement with ANCA Motion.
- The ambient temperature of the CNC assembly must not exceed 50°C. Please refer to Section 3.3 Ventilation Spacing for detailed ventilation requirement to remove heat generated from the system.

## 2.5 Labels on AMC6 CNC

The images below highlight the various labels on the AMC6 CNC and what they describe.



Figure 4 Label on the Bottom



Figure 5 Label on the Back



**Warning:** Do not tamper with these labels in any circumstances. Your warranty may be invalidated if the labels are damaged.

# 2.6 I/O Interface



Figure 6 I/O Interface



Note: The SW port is only applicable to ATX variant (see 2.3.1 Product Ordering Information).

### 2.6.1 Main Power - DCIN

The main power interface provides the DC power to the CNC and the acceptable input voltage rage is between +20~ $+28V_{DC}$ . Recommended input voltage is  $+24V_{DC}$ .

Pin	Function
1 0V_IN	
2	+24V <sub>DC</sub> _IN
3	+24V <sub>DC</sub> _IN
4	0V_IN



#### **Table 7 Main Power Pinout**

**Warning:** Even though the main power interface offers reverse polarity protection against motherboard damage, short circuiting to Earth will draw high current from power supply. Therefore appropriate circuit breaker is recommanded to protect the overall electrical power system.

### 2.6.2 Ground Screw - EARTH

The CNC must be connected to a common earth point in the machine electrical cabinet via this ground screw during operation all the time.

### 2.6.3 Power Indicator/Button

The Power On/Off button has an integrated LED indicator representing the CNC status. The meaning of the lighting colour is summarised below:

LED	CNC Status	
Green	CNC Power on status	
Red	CNC Off/Suspend status	

#### Table 8 Power Indicator

### 2.6.4 Remote Switch - SW

The remote switch provides the dry contact switch to power up the CNC with ATX variant. Be careful this that this switch is only support dry contact switch button and cannot connected to the external power and will cause CNC permanent damaged.

Pin	Function	<u>(</u>
1	GND	1
2	PS_ON#	2

**Table 9 Remote Switch Pinout** 

### 2.6.5 USB2.0 – USB1, USB2, USB3 and USB4

Four USB2.0 ports are used to connect peripheral devices to the CNC. These USB connectors are built onto the motherboard.

Pin	Signal	Pin	Signal	
1	5V	3	D+	
2	D-	4	GND	1 2 3 4

Table 10 - USB2.0 Pinout

### 2.6.6 USB3.0 - USB5, USB6, USB7 and USB8

Four USB3.0 ports are used to connect peripheral devices to the CNC. These USB connectors are built onto the motherboard.

Pin	Signal	Pin	Signal	
1	5V	5	Rx-	
2	D-	6	Rx+	9 8 7 6 5
3	D+	7	GND	
4	GND	8	Tx-	
		9	Tx+	

#### Table 11 USB3.0 Pinout



**Warning:** The stability of the USB signal can be degraded by overly long or low quality USB cable. If the USB cable is longer than 5m (USB2.0) or 3m (USB3.0), extension solutions such as active USB cable or power hub must be considered for reliable USB peripheral operation.

### 2.6.7 Ethernet/EtherCAT – LAN and EtherCAT

Two RJ-45 connectors allow the CNC to be connected to a local area network (LAN) or EtherCAT devices. The connector EtherCAT is the EtherCAT connector. The connector LAN is the Ethernet connector.

Pin	Signal	Pin	Signal	
1	Transmit +	5	Reserved	
2	Transmit -	6	Receive -	
3	Receive +	7	Reserved	
4	Reserved	8	Reserved	87654321

#### Table 12 LAN Pinout



**Note:** The user must connect EtherCAT devices to EtherCAT for correct operation of EtherCAT devices.

### 2.6.8 VGA Interface - VGA

One D-SUB VGA port is used to connect to standard VGA display devices.

Pin	Signal	Pin	Signal	
1	Red	2	Green	
3	Blue	4	NC	
5	GND	6	GND	5
7	GND	8	GND	10 000006
9	+5V	10	GND	15 00000 111
11	NC	12	DDC_DAT	
13	H-SYNC	14	V-SYNC	
15	DDC-CLK			

**Table 13 VGA Pinout** 

### 2.6.9 HDMI Interface - HDMI

One HDMI port can be used to connect to HDMI display devices.

Pin	Signal	Pin	Signal	
1	TMDS Data 2+	2	TMDS Data 2 shield	
3	TMDS Data 2-	4	TMDS Data 1+	
5	TMDS Data 1 shield	6	TMDS Data 1-	
7	TMDS Data 0+	8	TMDS Data 0 shield	
9	TMDS Data 0-	10	TMDS clock+	
11	TMDS clock shield	12	TMDS clock-	18 16 14 12 10 8 6 4 2
13	CEC	14	Reserved	
15	SCL	16	SDA	
17	DDC/CEC Ground	18	+5V	
19	Hot Plug Detect			

#### Table 14 HDMI Pinout

### 2.6.10 LED Indicators - LED 1-5

There are five LEDs showing the status of CNC.

LED	Function	
1	COM Port 1 – TX1	
2	COM Port 1 – RX1	
3	COM Port 2 – TX2	
4	COM Port 2 – RX2	4 RX2
5	HDD Status	5 0

#### Table 15 LED Indicators and Audio

### 2.6.11 Audio Ports – LINE OUT and MIC IN

MIC IN (pink) is the analog microphone audio input (mono or stereo). LINE OUT (green) is the analog line level audio output for the main stereo signal.

### 2.6.12 Serial COM Port – COM1 and COM2

Standard Serial COM Port (COM1 and COM2) can be used to support RS-232/422/485 function by BIOS selection. Serial communication interface uses the 9-pin male D-SUB connector and default setting is RS-232.

### 2.6.12.1 **RS-232**

Pin	Signal	Description	Pin	Signal	Description	
1	DCD	Data Carrier Detect	6	DSR	Data Set Ready	(1 2 3 4 5)
2	RD	Receive Data	7	RTS	Request to Send	
3	TD	Transmit Data	8	CTS	Clear to Send	6 7 8 9
4	DTR	Data Terminal Ready	9	RI	Ringing Indicator	Male
5	GND	Ground				

#### Table 16 RS-232 Pinout

### 2.6.12.2 **RS-422**

Pin	Signal	Description	Pin	Signal	Description	
1	TD-	Transmit Data -	6		NC	(1 2 3 4 5)
2	TD+	Transmit Data +	7		NC	
3	RX+	Receive Data +	8		NC	6 7 8 9
4	RX-	Receive Data -	9		NC	Male
5	GND	Ground				

#### Table 17 RS-422 Pinout

#### 2.6.12.3 **RS-485**

Pin	Signal	Description	Pin	Signal	Description	
1	D-	Data -	6		NC	(1 2 3 4 5)
2	D+	Data +	7		NC	
3		NC	8		NC	6 7 8 9
4		NC	9		NC	Male
5	GND	Ground				

Table 18 RS-485 Pinout

# 2.7 Video Interface

### 2.7.1 Video Signal Cable

There are two video interfaces available on the CNC, which are VGA and HDMI interfaces. When using these video interfaces to connect the monitor, the length of the cable can greatly impact display quality due to signal attenuations.

The cable length depends on the cable specification of manufacturer and the monitor's receiver capability. There are a few factors which determine the maximum of cable length:

- 1. Signal bandwidth: What resolution and refreshing rate are being used.
- 2. Physical cable characteristics: Cable loss characteristics, impedance matching quality ...etc.

Although no maximum length for a cable is specified by video interface specification, signal attenuation (which depends on the cable's construction quality and conducting materials) limits usable lengths in practice. While these video interfaces offer support for passive cables of varying lengths, the maximum of cable length which ANCA Motion recommends for optimal performance is:

#### **Maximum Length of VGA Cable**

The maximum of cable length which is recommended for maximum resolution (2048x1152 @ 60Hz) is 1.8 metres and the cable must meet the electrical specification of VGA.

#### **Maximum Length of HDMI Cable**

The maximum of cable length which is recommended for maximum resolution (3840x2160 @ 30Hz) is 1.8 metres and the cable must meet the electrical specification of HDMI.



**Note:** The cable length can be longer with lower resolution and under less noisy environment. Typically a high quality cable can run up to 5 meters without any issue but application test is recommended under the specific use case scenarios.

#### **Video Cable Applications**

There are four solution strategies, depending on the required length of the video cable between the CNC and the monitor.

- 1. Video connection kit for distances 5 metres or less
  - A 5 metres video connection kit (ANCA Motion 619-0-00-1933) is required. This kit contains:
    - 1 x 5 metres HDMI-HDMI copper cable (ANCA Motion ICN-1026-2256)
    - 2 x Ferrite Cores (ANCA Motion ICN-3132-0083)
    - 1 x 600mm Adaptor Cable HDMI-DVI (ANCA Motion 619-0-00-1398)

Photograph of 5 metres video connection kit contents below:



Figure 7 5 metres video connection kit

Fit one Ferrite Core (ANCA Motion ICN-3132-0083) to each end of the 5 metres copper HDMI cable. Ensure that each half of the plastic housing contains a Ferrite Core before clipping it over the cable (see *Figure 8*). Use the key to release the latches if you need to remove the Ferrite Core from the cable.



Figure 8 Ferrite core on copper HDMI cable

#### 2. Video connection kit for distances more than 5 metres

Video cable kits are available with 10 meters, 15 metres and 20 metres hybrid fibre optic cables.

- a) 10 metre video cable (ICN-1026-2293) connection kit (619-0-00-2233)
- b) 15 metre video cable (ICN-1026-2294) connection kit (619-0-00-2234)
- c) 20 metre video cable (ICN-1026-2255) connection kit (619-0-00-1934)

Each kit contains:

- 1 x HDMI Hybrid Optic Fibre Cable
- 2 x Ferrite Cores (ANCA Motion ICN-3132-0084)
- 1 x 600mm Adaptor Cable HDMI-DVI (ANCA Motion 619-0-00-1398)

Photograph of kit contents below:



#### Figure 9 Video cable kit

Fit one ferrite core (ANCA Motion ICN-3132-0084) to each end of the HDMI hybrid optical fibre cable. Note that even though this is an optical fibre cable, there are still copper conductors employed, and the ferrite cores are necessary. Ensure that each half of the plastic housing contains a ferrite core before clipping it over the cable (see *Figure 10*). Use the key to release the latches if you need to remove the ferrite core from the cable.



#### Figure 10 Ferrite Core on hybrid optic fibre cable



**Warning:** The hybrid optical fibre cable is directional. Be sure to connect the "Source" end to the CNC, and the "Display" end to the cable of monitor/adaptor. There are arrows marked on the hybrid optical fibre cable to show the signal direction, which is away from the CNC, and towards the monitor. When running hybrid optical fibre cable, please pull/place the cable carefully. Kinks due to careless handling will result in poor performance (or complete failure).

### 2.7.2 Stability of the Video Signal

There are multiple factors affecting the stability of the video signal. The quality of the cable as described in 2.7.1 *Video Signal Cable* is one of the factors. It is also equally important to ensure the conductive noise is minimised.

It is recommended that only one Video output is connected (Primary and only Display) to the CNC, to avoid Windows unintendedly switching to the wrong display. Windows detects the connected monitors/cables and make decision to configure multiple displays which occasionally can cause malfunction of the Primary Display.

It is also recommended that the video cable is routed through to the CNC avoiding close proximity to high voltage or radiated source.

Running non-core software in the CNC might affect the display stability if the software stresses the display system. For instance, 3D simulation software might cause extensive use of the video RAM which might reduce the video bandwidth for the primary display.

Ensure that cabinet design complies with installation requirements of all the other ANCA Motion components in the system. ANCA Motion Field Applications Engineers can assist with a system audit.

# 3 Installation and Operation

# **3.1 Removing the CNC from the Packaging**

Once the CNC is received please do the following:

- Remove CNC from packaging.
- Dispose of packaging in an environmentally friendly manner.
- Ensure delivered contents match your order.
- Any inconsistencies should be reported to your local ANCA Motion support agency.

# 3.2 Installation Guidelines

The CNC is designed to be installed in an enclosure which remains closed during operation. The CNC heat sink must be mounted in a vertical orientation perpendicular to the ground to ensure optimum air flow and cooling.



Figure 11 Installation Orientation

Please use M8 screws (not included) to mount the CNC bracket. Please refer to 5.2 5.2 *Physical Dimensions for screw spacing.* The cabinet layout should be arranged in such a way that:

- System identification labels and markings can be easily sighted.
- External cabling can be installed and accessed easily.
- Ensure that the CNC is protected all the times from dust, heat and moisture.



#### Warning:

- 1. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
- 2. Heat sink orientation will affect the air convection and heat dissipation, the CNC heat sink must be mounted with fins perpendicular to the ground to prevent the equipment overheating.
- Do not access the system BIOS to make changes to CNC settings. Unauthorised system changes may result in unreliable operation and possible serious damage to the CNC machine and/or personal injury.

# 3.3 Ventilation Spacing

When the CNC is installed in an enclosed cabinet, please ensure adequate space for ventilation. The recommended ventilation spacing is larger than 50 mm is required to pass though the heat sink.



**Figure 12 Ventilation Spacing** 



**Note:** Insufficient airflow or ventilation spacing may result in overheating of the CNC which may compromise its performance and lifespan.

# **3.4 Wiring Power to the CNC and Earthing Guidelines**

Use correct wire sizes to connect to the main power connector.

Main Power - DCIN	Description	Wire Size	
Pin 1, 4	0V_IN	1.0 ~ 0.75 mm <sup>2</sup>	
Pin 2, 3	+24V <sub>DC</sub> _IN	1.0 ~ 0.75 mm <sup>2</sup>	

#### **Table 19 Main Power Wire Size**

Connect the CNC to a central earth point in the machine electrical cabinet. The minimum standards for the wire connecting to the earth stud (EARTH) are shown as below:

Wire Gauge	2.0 mm <sup>2</sup>
Terminator	M4 Ring Lug
Torque	1 Nm

#### Table 20 Earth Stud Wire Size

### **3.5 Powering the CNC**

The CNC with AT variant is designed to be powered by a  $24V_{DC}$  supply and automatic power up when  $24V_{DC}$  supply be provided.

The CNC with ATX variant is designed to be powered by a  $24V_{DC}$  supply and used a dry contact remote switch to power up the CNC. Below illustration is the schematic diagram of remote switch signal and be careful that do not connect to any external voltage on there that it could be cause permanent damaged the CNC.



Figure 13 Remote Switch Schematic Diagram

# 3.6 Operating Systems

The AMC6 CNC will be pre-installed with Windows operating system. An USB memory stick will also be delivered with the CNC as a recovery media.



Figure 14 Platform Maintenance Kit

The type of operating system required for the user depends on the application:

РМК	Core Features	
Platform Maintenance Kit 10 (PMK10)	Windows 10 IoT Enterprise 2016 LTSB INtime 6, Whitelist Antivirus	

#### **Table 21 Platform Maintenance Kit**



1. All required drivers are pre-installed with the operating system.

2. See 2.3 Ordering Information

3. Regarding to how to configure the PMK, please see relevant PMK User Manual.

# 3.7 BIOS Information

Note:

The AMC6 BIOS is specifically optimised for real time performance. The settings of the BIOS can be viewed by entering BIOS screen, pressing **DEL** key during boot-up, and entering with the following password:

User Password: **anca** Administrator Password: **service** 

The user can change the boot device sequence, but the authority level of the above password will not allow the user to change other settings. Please contact ANCA Motion support if you need to make other adjustments. The BIOS also contains critical manufacturer information such as part number, serial number, vendor name, and product name. Please do not attempt to modify the BIOS in anyway because it can invalidate the device warranty.

### 3.8 Connecting External Devices to the CNC

When connecting any device to the CNC, please ensure that both the device and CNC are not connected to a power supply. Ensure all relevant devices' documents are read before installing and connecting peripherals to the CNC. All cables must be handled properly; handling should be done on the plug. ANCA Motion does not recommend disconnecting cables / wires from devices.



#### Warning:

- 1. If installed, please ensure the power supply has been turned off for at least five minutes before connecting any device to the CNC, or it will allow any residual voltages to discharge.
- 2. Before connecting the  $24V_{DC}$  power supply to the CNC, please ensure the correct voltage is being supplied.

When connecting devices to the CNC, the following procedure should be followed:



Figure 15 Connecting Procedure

# 4 Troubleshooting

Symptom	Possible Cause
Nothing happens when CNC is turned on	<ul> <li>✓ Check power supply to the CNC</li> </ul>
	<ul> <li>Check system on switch</li> </ul>
LCD displays "no video input"	✓ Check VGA connection
	<ul> <li>Check other display connections</li> </ul>
System displays "Boot Disk Failure"	<ul> <li>✓ Check any attached USB flash drives or USB DVD drives</li> </ul>
System is running but software doesn't operate	✓ Software fault or fault external to CNC
CNC operating system locks up during boot and or	<ul> <li>Check system for virus / spyware</li> </ul>
operation	✓ Faulty hardware component
System is running slow when idle	✓ Check system for virus / spyware
	<ul> <li>Check available HDD space</li> </ul>
System reboots during operation	<ul> <li>Check power supply to the CNC</li> </ul>
	<ul> <li>Check system for virus / spyware</li> <li>Faulty bardware component</li> </ul>
	<ul> <li>✓ Temperature limit exceeded</li> </ul>

Table 22 Troubleshooting

# **5** Specifications

# **5.1 Product Specifications**

### 5.1.1 Environmental Specifications

Attribute	Qualification				
5.1.1.1 Storage					
Ambient Temperature	-40 to +85° C				
Relative Humidity	5 to 95%				
Average lifespan of CMOS Battery	3 years				
5.1.1.2 Installation and Operation					
Permissible Ambient Temperature	0 to +50° C				
Relative Humidity	5 to 85% non-condensing				

	5
Mechanical vibration	3 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 Oct/min., 1
	hr/axis, x,y,z 3 axes
Shock	20 G, IEC 60068-2-27, half sine, 11 ms duration
Ingress Protection Rating	IP20

#### **Table 23 - Environmental Specifications**

### 5.1.2 Electrical Specifications

Attribute	Qualification
Nominal Input Voltage	24V <sub>DC</sub>
Input Voltage Range	20-28V <sub>DC</sub>
Nominal Input Current	5A
Maximum Power Consumption	116W
CMOS Battery	BT2032 3V/190mAh

#### **Table 24 Electrical Specifications**



#### Warning:

- 1. The CMOS battery may be consumed if the CNC is in storage for an extended period of time. The battery stores the system time and date. If the CMOS battery is out of charge, you will be prompted to reset the time and date when you power on the computer.
- 2. The CMOS battery is not user serviceable, please contact your nearest ANCA Motion office or Authorized Service Agent.

Attribute	Qualification
CPU	Intel® Core™ i5-9500TE 2.2GHz 6 Cores Processor
Chipset	Intel H310
Memory	8 GB DDR4
	Controller: Intel® UHD Graphics 630, supports DirectX12 and OpenGL 4.5
Craphica	Graphics Video Max Memory: 1.7
Graphics	VGA: supports max resolution 2048x1152 @ 60 Hz
	HDMI 2.0: supports max resolution 3840x2160 @ 30 Hz
Ethorpot	GbE LAN1: Intel i219V
Ethernet	GbE LAN2: Intel i210IT
SSD	64/256/512 GB mSATA module
	SATA Revision 3.2 compliant
	Supports Fragment Writing and Flush Manager
Rear I/O	VGA x 1
	HDMI x 1
	Ethernet x 2
	USB3.0 x 4
	USB2.0 x 4
	Audio x 2 (Mic-in, Line-out)
	Serial COM Port x 2 (Supports RS-232/422/485 function by BIOS selection)
	Remote Switch x1 (only available on ATX variant)
Watchdog Timer	Interval programmable 1 ~ 255 sec/min
Dimensions (W x H x D) (mm)	230 x 250 x 82.2
	Details refer to section 5.2 5.2 Physical Dimensions
Weight (kg)	2.8

### 5.1.3 Hardware Specifications

#### Table 25 Hardware Specifications

### 5.1.4 Supported Fieldbus Profiles

Attribute	Qualification
EtherCAT Interface	Standard: IEC 61158 Physical Comm: IEEE-802.3 LED Indicators: Connect/Activity Connector: RJ45 Data Rate: 100Mbps PC Interface: Onboard LAN2: Intel i210IT (LAN2)

Table 26 Supported Fieldbus Profiles

# 5.2 Physical Dimensions

All dimensions given are in mm.



# 5.3 Mounting Bracket Setup

To attach the mounting bracket on the AMC6 CNC:

- 1. Take the mounting kit from the accessory box.
- 2. Secure with 4x M4 screws as shown in Figure 17 Mounting Bracket Setup.



Figure 17 Mounting Bracket Setup

# 6 Certificates and Approvals

# 6.1 CE Approval

CE

2014/30/EU EMC Directive

To demonstrate conformity, this product has been designed to adhere to the following standards:

Item	Test Standard	
Emission	EN 55032:2015	Electromagnetic compatibility of multimedia equipment. Emission requirements
Immunity	EN 55024:2010/A1:2015	Information technology equipment - Immunity characteristics - Limits and methods of measurement

This product is in conformance with the following European Directives while installing in accordance to the installation instructions contained in the product documentation:

#### **Table 27 Certificate**

The EC declarations of conformity are available for the relevant authorities at the following address:

ANCA GmbH Alois-Senefelder-Str.4 68167 Mannheim Germany

### 6.2 FCC Certification

The AMC6 CNC complies with the Federal Communication Commission standard FCC Part 15 subpart B Class A and its operation is subjected to the following two conditions:

- 1. This device may not cause harmful interference, and
- 2. This device must accept any interference received, including interference which may cause undesired operation.

# 6.3 UKCA Approval

The AMC6 CNC complies with UK-GB Regulation(s) below:

- The Electromagnetic Compatibility Regulations 2016
- The Electrical Equipment (Safety) Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electronic and Electronic Equipment Regulations 2012

Below designated standards were taken conferring a presumption of conformity with the relevant UK-GB regulations:

- BS EN 55011:2016+A11:2020 Group 1 Class A
- BS EN 55032:2015+A11:2020 Class A
- BS EN 55035:2017+A11:2020
- BS EN 61000-3-3:2013+A1:2019
- BS EN 61000-6-4:2007+A1:2011
- BS EN IEC 61000-3-2:2019+A1:2021 Class D
- BS EN IEC 61000-6-2:2019

## 6.4 Software License Agreement

Software agreements for any software installed in the AMC6 CNC must be observed.

### 6.5 Low Voltage Directive

The AMC6 CNC meets 2014/35/EU Low Voltage Directive, Article 1. The input voltage is DC 24V and not included in 75V~1500V for direct current. Its operation is in safe low voltage range.

# 7 Additional Information

### 7.1 Maintenance and Repairs

There are no user serviceable parts inside the ANCA Motion CNCs. For any repairs, please contact your nearest ANCA Motion office or Authorized Service Agent.

# 7.2 Product, Sales and Service Enquiries

If you require assistance for installation, training, or other customer support issues, please contact the closest ANCA Motion Customer Service Office in your area for details.

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## 7.3 Feedback

This Manual is based on information available at the time of publication. Reasonable precautions have been taken in the preparation of this Manual, but the information contained herein does not purport to cover all details or variations in hardware and software configuration. Features may be described herein which are not present in all hardware and software systems. We would like to hear your feedback via our website: <a href="https://www.ancamotion.com/Contact-Us">www.ancamotion.com/Contact-Us</a>