

# ANCA Motion AMC5 CNC - User Manual

D-000076 Rev 05



# ANCA Motion AMC5 CNC - User Manual

**Some Important Links** 

**Related Manuals and Brochures** 

Sales and Support Contact Information

Related Documentation Product, Sales, and Service

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#### **Chapter Summaries**



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# **1** Introduction

### **1.1 Using this Manual**

### **1.1.1 Manual Conventions**

### DANGER:

Represents a possible risk of injury / death to persons unless extreme care is taken



#### WARNING:

Indicates that care must be taken



#### **NOTE:** Information to clarify

NOTE:

### 1.1.2 Users of the Manual



The information within this document is intended for trained specialists in the Control and Automation Industry. It is important that this information is followed carefully when installing or using this product.

This manual is a guide describing the installation and operation of an ANCA Motion AMC5 CNC. It has been written specifically to meet the needs of ANCA's OEM clients, trade persons, technicians and everyday operators. It is important that this information is followed carefully when installing or operating this unit. This device may only be used within the operating boundaries described in the Technical Specifications section of this document. It is the responsibility of the operator of this device to ensure 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:

- CNC Product Overview
- Product Specifications
- Installations and Operation
- Troubleshooting
- Support and Service Information

### 1.1.3 Definitions, Abbreviations and Nomenclature

Abbreviation	Description
AMC5	ANCA Motion Controller 5
ANCA	Australian Numerical Control and Automation
ASSY	Assembly
BIOS	Basic Input Output Subsystem
CNC	Computer Numerical Control
DC	Direct Current
DP	Display Port
DVI	Digital Visual Interface
EMC	Electromagnetic Compatibility
E-Stop	Emergency Stop
EtherCAT	Ethernet for Control Automation Technology
Ethernet	Network Protocol
FP	Front Panel
GB	Giga-Byte
GHz	Giga-Hertz
HDMI	High-Definition Multimedia Interface
LED	Light Emitting Diode
LVD	Low Voltage Directive
МВ	Mega-Byte
PCle	Peripheral Connect Interface Express
РМК	Platform Maintenance Kit
SERCOS	Serial Real-time Communication System
SSD	Solid State Disk
USB	Universal Serial Bus
VGA	Video Graphics Array
Serial COM Port	Standard Serial COM Port (Only support RS-232 function)

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### **1.2 Change Control History**

Version	Date	Change Description	Author	Authority
1.0	2014-07-24	Initial Draft	СС	RK
1.1	2014-08-04	Second draft	John Isailofski	MD
1.2	2014-09-10	Updated from comments. Ready for DCO	John Isailofski	MD
1.3	2014-09-10	Wording changes after DCO	Migara D	MS
2.0	2015-08-03	Remove Draft watermark, correct ANCA Motion information, correct Window Embedded 8 Standard, and add the description of 946-1-00-1000 and 946-1-01- 1000	Charles C.	RK
3.0	2017-05-10	Added new AMC5 CNC types for Serial COM Ports and AT Power Option Mode	Nick L	RK
4.0	2017-09-27	<ol> <li>Added new AMC5 CNC types</li> <li>Corrective content of user manual</li> </ol>	Nick L	RK
5.0	2018-05-03	Added sections of video interfaces and video cable applications	Nick L	RK

### **1.3 Liability Conditions**

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



#### WARNING:

Product warranty will be void if the label or license stickers is broken or removed



#### WARNING:

All components of this product are selected and tested to be compatible with Core CNC software; the product warranty will be void if any component is changed without prior agreement with ANCA Motion.



#### WARNING:

The ambient temperature of the CNC assembly must not exceed 50°C. For reliable long term operation, appropriate ventilation is highly recommended to remove heat generated from the CNC.

### 1.4 Labels on AMC5 CNC

The images below highlight the various labels on the AMC5 CNC and what they describe.



Figure 1 - Label on front



Figure 2 - Label on Right side



Figure 3 - Label on Top

## 1.5 AMC5 CNC variant Applicability

This manual is applicable to the following variants of ANCA Motion AMC5 CNC:

Product	Part Number	Customer Order Code
CNC ASSY AMC5 SERCOS PMK8	946-0-00-1000	AMC5-B8330-0S00
CNC ASSY AMC5 SERCOS PMK9	946-0-01-1000	AMC5-B9330-0S00
CNC ASSY AMC5 ECAT PMK8	946-1-00-1000	AMC5-B8330-0E00
CNC ASSY AMC5 ECAT PMK9	946-1-01-1000	AMC5-B9330-0E00
CNC ASSY AMC5 ECAT-SC PMK9	946-2-01-1000	AMC5-B9330-1E00
CNC ASSY AMC5 ECAT-SC-PAT PMK9	946-3-01-1000	AMC5-B9331-1E00
ASSY AMC5 ECAT-PAT PMK9	946-4-01-1000	AMC5-B9331-0E00
ASSY AMC5 ECAT-PAT PMK9	946-5-01-1000	AMC5-B9332-0E00
ASSY AMC5 ECAT-EV PMK9	946-6-01-1000	AMC5-D9333-0E00
AMC5 SERCOS PMK8/9	946-0-XX-1000SP	NA
AMC5 ETHERCAT PMK8/9	946-1-XX-1000SP	NA

### 1.6 Copyright

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Programming examples, procedures, and suggestions contained herein are intended for illustrative purposes only, and do not necessarily apply to any particular part. They may be incorrect, or they may be misinterpreted. In addition, the machines may have been mis-installed or no longer functioning correctly. Any programming example, procedure or suggestion must be tested in the particular application fully before being used in production.

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ANCA Motion, 1 Bessemer Road, Bayswater North, 3153, Victoria, Australia,

# 2 Product Overview

# 2.1 CNC Unit

The AMC5 CNCs are an industrial PC that has been designed for control systems applications. The chassis of the CNC has been designed for the CNC to be installed in protected environments.



Figure 6 – EtherCAT with Serial COM Port Type



Figure 5	-	EtherCAT	Туре
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The AMC5 CNC consists of:

- IPC motherboard with an Intel Core i7 CPU
- ✓ 8 GB System memory
- ✓ ATX power supply
- ✓ 12V<sub>DC</sub>/4A power supply
- ✓ 64 GB Solid State Disk
- ✓ 1 x EtherCAT and 1 x Ethernet ports
- ✓ USB2.0(x4) and USB3.0(x4)
- ✓ 1 x VGA connection via 15 pin female D-SUB connector
- ✓ 1 x HDMI port
- ✓ 2 x Display Ports (DP)
- ✓ Audio Output
- ✓ PS/2 Keyboard and Mouse
- ✓ SERCOS master card (NOTE 1)
- ✓ Serial COM Ports (NOTE 2)

All external system devices can interface to the Front Panel CNC unit via USB communications or an EtherCAT / SERCOS data link for real time communications. All system functions and programs are loaded and run from within the controller.



NOTE:

SERCOS master card is only installed on 946-0-00-1000, 946-0-01-1000 and 946-0-XX-1000SP.
 Serial COM Ports option is only available on 946-2-01-1000 and 946-3-01-1000.

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### 2.2 Interface



#### USB3.0 - X101, X102, X103 and X104

Four USB3.0 ports are used to connect peripheral devices to the CNC. These USB connectors are built onto the motherboard. However, Windows XP uses only USB 2.0 due to lack of USB3.0 driver support.

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

#### USB2.0 - X105, X106, X107 and X108

Four USB2.0 ports are used to connect peripheral devices to the CNC. These additional USB connectors are wired out from the motherboard. USB 2.0 is supported.

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

#### Master Card Activity Indicators - LED 1-6

There are six LEDs showing the status of the master card.

LED	Function	LED1 LED2 LED3 LED4 LED5 LED6
LED1	E-STOP1 OK (Green)	
LED2	Watch Dog ERR (Red)	
LED3	E-STOP2 OK (Green)	
LED4	SERCOS Tx Active (Green)	

LED5	SERCOS ERR (Red)
LED6	SERCOS Rx Active (Green)

#### SERCOS - X109 and X110

There are two connectors on the SERCOS master card. SERCOS communication interface uses the 9-pin female D-SUB connector (X110). There is also a safety interface to offer watchdog and estop functions via the 9-pin male D-SUB connector (X109).

Pin (Male) X109	Signal	Pin (Female) X110	Signal	_
1	WD1	1	Transmit +	9876
2	ES1	2	Receive +	
3	N/C	3	N/C	<u>6 4 3 2 1</u>
4	ES3	4	N/C	Male
5	WD2	5	N/C	
6	N/C	6	Transmit -	
7	ES4	7	Receive -	
8	ES2	8	N/C	Female
9	N/C	9	N/C	

#### Ethernet/EtherCAT - X111 and X112

Two RJ-45 connectors allow the CNC to be connected to a local area network (LAN) or EtherCAT devices. The connector in the right hand side (X112) is the EtherCAT connector. The connector in the left hand side (X111) 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

#### NOTE:

The user must connect EtherCAT devices to X112 for correct operation of EtherCAT devices

#### Audio Ports - X113, X114 and X115

X113 (pink) is the analog microphone audio input (mono or stereo). X114 (green) is the analog line level audio output for the main stereo signal (front speakers or headphones). X115 (blue) is the analog line level audio input.

#### HDMI - X116

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

#### DP - X117 and X118

Two Display Ports can be used to connect to DP display devices.

#### VGA - X119

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

#### PS/2 Keyboard and Mouse - X120 and X121

The purple connector (X120) can be used to connect to PS/2 keyboard, and the green connector (X121) can be used to connect to PS/2 mouse or pointing device.





#### Power & System Start - X122

The motherboard is configured in AT or ATX mode, and the exact type of mating connector must be used for this connector. This connector has the following pin-outs:



The difference in power up behavior between AT and ATX mode is on the first time when the main  $24V_{DC}$  power is connected to pin5/pin6:

- 1. AT mode: CNC will power up automatically when the main power is connected.
- 2. ATX mode: CNC will not power up until both the main power is connected and pin3/pin7 are shorted.

The CNC takes  $24V_{DC}$  as the main power input into pin5/pin6. The  $24V_{DC}$  is relayed out via pin1 to signal external devices that the CNC is powered on, and this signal is disabled when the CNC is powered off. The CNC is powered up via shorting pin3 and pin7 (Refer to <u>4.5.2</u> Power Enable Wiring for more details). In addition, pin4/pin8 offers a  $12V_{DC}$  power supply for external devices such as LCD monitor. This  $12V_{DC}$  output is only enabled when the CNC is powered on, and offers a rated current of 4A (48W).



- 1. The  $24V_{DC}$  power supply to the CNC unit must be protected with a 4A Circuit breaker.
- 2. The 12VDV\_OUT power supply is fully protected. It is only to be used for powering the CNC Pad display. If it is used for any other purposes, or if any other devices are added to it, unreliable behaviour may result, or the power supply may automatically shut down in self protection.
- The mating plug connector may be ordered from your local ANCA Motion sales branch, refer to 3.5 Ordering Information.
   (1) CNC\_ON, (4) 12VDC\_OUT and (8) 0VDC\_OUT are may not available on some product.

#### WARNING:

. PWR\_ENA (Pin3) and PWR\_ENB (Pin 7) are 5V<sub>DC</sub> voltage level.

2. If external power is connected on any of the pins it will cause permanent damage to motherboard.

#### Ground Stud - X123

At all times during operation the CNC unit must be connected to a common earth point in the machine electrical cabinet via this Ground Stud.

#### Power Indicator - LED 7

LED7 is a dual color indicator on the internal  $24V_{DC}$ - $12V_{DC}$  converter. This converter is a separate board from the motherboard, but is wired such that it can be used to represent the CNC status as well. The meaning of the lighting status is summarized below:

LED7	Internal 24V <sub>DC</sub> -12V <sub>DC</sub> Converter	CNC Status
OFF	24V <sub>DC</sub> Missing or Output Overloaded	X122 Not Connected or $12V_{DC}$ Overloaded
RED	12V <sub>DC</sub> Output Disabled	X122 Connected & CNC Powered OFF
BLUE	12V <sub>DC</sub> Output OK	X122 Connected & CNC Powered ON

#### Serial COM Ports - X124, X125 (Only for Serial COM Port type)

There are two connectors on the standard Serial COM Port extension card where COM1 is X124 and COM2 is X125. Serial communication interface uses the 9-pin male D-SUB connector.

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				

### 2.3 Video Interfaces

There are three video interfaces available on the CNC, which are VGA (X119), DisplayPort (X118 and X117) and HDMI (X116) 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 length that a cable can go is dependent on the cable specification of manufacturer and receiver capability of monitor. There are a few factors that go into determining the maximum length:

- 1. Signal bandwidth: What resolution and refresh rate is 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 but signal attenuation (dependent 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 cable length that ANCA Motion recommends for optimal performance is:

#### Maximum length of VGA cable

The maximum cable length that is recommended for maximum resolution (2048x1536) is 1.8 meters and the cable must meet the electrical specification of VGA.

#### Maximum length of DisplayPort cable

The maximum cable length that is recommended for maximum resolution (2560x1600) is 2 meters and the cable must meet the electrical specification of DisplayPort.

#### Maximum length of HDMI cable

The maximum cable length that is recommended for maximum resolution (1920x1080) is 3 meters and the cable must meet the electrical specification of HDMI.

### 2.4 Video Cable Applications

Physical effects make it impossible to transmit high-speed electrical signals over very long passive cables. The distance limitation becomes a problem, especially in industrial applications. To solve the problem of limited distance, one recommended solution for industrial applications is using video extender over Ethernet cable to carry the signal longer distances without losing signal integrity.

Video extenders support DisplayPort, DVI and HDMI interfaces. HDMI requires consideration for connector retention as it does not provide a latching mechanism to equipment.

The Display Data Channel (DDC) feature is a key requirement when selecting the video extender. The DDC allows for the Extended Display Identification Data (EDID) from a connected monitor to be transmitted to the AMC5 CNC for Windows to recognize resolution and product ID. This feature is important to ensure correct configuration of the monitor. Some video extenders require a separate cable for the DDC feature.

The solution of video extender over Ethernet cables is illustrated below. It is highly recommended to use shielded Ethernet cables such as CAT6A F/UTP suitable for an industrial application.



#### NOTE:

Apart from signal attenuation, external interference (e.g. power-line noise) can also impact display quality (e.g. flickering due to data loss). Please ensure the video cable is not wired across or close to noisy power lines that emits switching noise.

# **3 Product Specifications**

## 3.1 Certificate and Approvals

### 3.1.1 CE Approval

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

#### 2014/30/EU EMC Directive

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

ltem	Test Standard	
Emission	EN 55032:2012	Electromagnetic compatibility of multimedia equipment. Emission requirements
Immunity	EN 55024 : 2010	Information technology equipment - Immunity characteristics - Limits and methods of measurement

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

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

#### FCC Certification

The AMC5 CNC complies with the Federal Communication Commission standard FCC Part15 subpart B Class A and its operation is subject to the following two conditions:

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

#### Software License Agreement

Software agreements for any software installed in the AMC5 CNC must be observed.

#### Low Voltage Directive

The AMC5 meets 2006/95/EC LVD 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.

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# 3.2 Technical Specifications

### 3.2.1 General Specifications

Dimensions (W x H x D) (mm)	313.5 x 221 x 86.3		
	Details refer to section 3.4 Physical Dimensions		
Weight (kg)	2.5		
Nominal Input Voltage (X122 Pin5)	24V <sub>DC</sub>		
Input Voltage Range	21-28V <sub>DC</sub>		
Nominal Input Current	4A (1.8A for MB, 2.2A for 12V Output)		
Power Consumption (NOTE)	43W (12V output unloaded)		
	96W (12V output fully loaded)		
Output 24V Rating (X122 Pin1)	Relayed out from Input Voltage		
Output 12V Rating (X122 Pin4)	4A DC		
Output 12V Accuracy and Ripple	+/-2%, 20mV RMS Max		
Output 12V Ramp Up Time	14ms		
Output 12V Soft Start Time	14ms (sufficient for load 2720uF+2A)		
Output 12V Protection	6.25A		
IP Protection	20		
Ambient Temperature	5-50 °C (Operating)		
Relative Humidity	5%-80% non-condensing (Operating)		
Vibration	58-500Hz 1G (Operating)		
Shock	50m/s <sup>2</sup> 30ms (Operating)		

The maximum power concumption may reached 126W and depend on peripherals.

### 3.2.2 Motherboard

NOTE:

1

CPU	Intel <sup>®</sup> Core <sup>™</sup> i7-3610QE 2.3GHz Quad Core Processor
Chipset	QM77
Memory	8GB DDR3
Graphics	Controller: integrated Gfx Gen 7, supports DirectX11, OpenGL 3.1 and OpenCL 1.1
	VRAM: shared system memory, 2GB and above, total system memory shared 1GB maximum video memory
	VGA: supports max resolution 2048 x 1536
	HDMI: HDMI 1.4, 1650 Mbps/channel with 165 MHz
Ethernet	GbE LAN1: Intel 82579LM
	GbE LAN2: Intel 82583V
SSD	64GB mSATA module 600MB/s (SATA3.0)
	Supports Fragment Writing and Flush Manager
Rear I/O	VGA x 1
	HDMI x 1
	Display Port x 2
	Ethernet x 2
	<b>USB3.0</b> x 4
	Audio x 3 (Mic-in, Line-out, Line-in)
	Serial PS/2 x 2 (1 x keyboard and 1 x mouse)
	USB2.0 x 4 (Via External Connectors)
	Serial COM Port x 2 (Only support RS-232 function)
Watchdog Timer	Interval programmable 1 ~ 255 sec/min

### 3.2.3 Field Buses

SERCOS Interface	Standard: IEC/EN 61491
	Physical Comm: RS485
	LED Indicators: Tx/Rx/Err
	Connector: 9pin D-sub
	Data Rate: 16Mbaud Max
	PC Interface: PCI Express (PCIe) r1.0a
	Estop: 2 x channels E-Stop, for each channel a relay (rated at 1A ,24V <sub>DC</sub> ) used to offer a pair of dry contact output points, and associated with a Green LED.
	Watchdog: 1 x channel watchdog relay output (dry contacts rated at 1A ,24V <sub>DC</sub> ), associated with a Red LED. Once enabled, the watch dog circuit shall trigger the output if software stops strobing the circuit for 524ms
EtherCAT Interface	Standard: IEC 61158
	Physical Comm: IEEE-802.3
	LED Indicators: Connect/Activity
	Connector: RJ45
	Data Rate: 100Mbps
	PC Interface: Onboard LAN2: Intel 82583V (X112)

### 3.2.4 Operating Systems

The AMC5 CNC will be pre-installed with one of the two operating systems below. A USB memory stick will also be delivered with the CNC as a recovery media.



Figure 12 – PMK Product

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

РМК			Core Features	
Platform Maintenance Kit 8 (PMK8)		intenance Kit 8 (PMK8)	Windows XPe, INtime 4, Whitelist Antivirus	
Platform Maintenance Kit 9 (PMK9)		intenance Kit 9 (PMK9)	Windows Embedded 8 Standard, INtime 5, Whitelist Antivirus	
i	<ol> <li>NOTE:</li> <li>All required drivers are pre-installed with the operating system.</li> <li>See <u>3.5 Ordering Information</u></li> <li>how to configure the PMK please see the relevant PMK User Manuals (AMPMK - User Manual x.xx.pdf).</li> </ol>		ed with the operating system. see the relevant PMK User Manuals (AMPMK - User Manual x.xx.pdf).	

### 3.3 BIOS Information

The AMC5 BIOS is specifically optimised for real time performance. The settings of the BIOS can be viewed by entering BIOS screen by pressing DEL key during boot-up, and entering the following 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. 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 as it can void the device warranty.

# 3.4 Physical Dimensions

All dimensions given are in mm.





Figure 13 - Dimension

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### 3.5 Ordering Information

### 3.5.1 Product Ordering Information

Description	Part Number	Customer Order Code	Quantity	Operating System
CNC ASSY AMC5 SERCOS PMK8	946-0-00-1000	AMC5-B8330-0S00	NA	Windows XP Embedded
CNC ASSY AMC5 SERCOS PMK9	946-0-01-1000	AMC5-B9330-0S00	NA	Windows Embedded 8 Standard
CNC ASSY AMC5 ECAT PMK8	946-1-00-1000	AMC5-B8330-0E00	NA	Windows XP Embedded
CNC ASSY AMC5 ECAT PMK9	946-1-01-1000	AMC5-B9330-0E00	NA	Windows Embedded 8 Standard
CNC ASSY AMC5 ECAT-SC PMK9	946-2-01-1000	AMC5-B9330-1E00	NA	Windows Embedded 8 Standard
CNC ASSY AMC5 ECAT-SC-PAT PMK9	946-3-01-1000	AMC5-B9331-1E00	NA	Windows Embedded 8 Standard
CNC ASSY AMC5 ECAT-PAT PMK9	946-4-01-1000	AMC5-B9331-0E00	NA	Windows Embedded 8 Standard
CNC ASSY AMC5 ECAT-PAT PMK9	946-5-01-1000	AMC5-B9332-0E00	NA	Windows Embedded 8 Standard
CNC ASSY AMC5 ECAT-EV PMK9	946-6-01-1000	AMC5-D9333-0E00	NA	Windows Embedded 8 Standard
				Windows XP Embedded
AMC5 SERCOS PMK8/9	946-0-XX-1000SP	NA	NA	or Windows Embedded 8 Standard
	946-1-XX-1000SP			Windows XP Embedded
AMC5 ETHERCAT PMK8/9		NA	NA	or Windows Embedded 8 Standard

### 3.5.2 Accessories

This section contains summarized information on accessories available for the AMC5 CNC as follow:

Description	Part Number	Manufacturer	Model Number	Quantity
Platform Maintenance Kit 8	963-X-XX-0045 <sup>(NOTE)</sup>	ANCA Motion	NA	1
Platform Maintenance Kit 9	963-X-XX-0049 <sup>(NOTE)</sup>	ANCA Motion	NA	1
Power Connector, 8 Pins, Female	ICN-3077-1003	Positronic	PLB08F0000/AA	1
Connector Pins, Male	ICN-3077-1004	Positronic	MC116N/AA	4 ~ 7
CB 1 PHASE 4A	ICN-3088-0175	Eaton Moeller	PLSM-C4	1
AMC5 Demo Wiring Loom	646-0-00-8737	ANCA Motion	NA	1



NOTE:

Where X-XX is any number and please query to your machine provider for suitable product version.

### 3.5.3 Catalogue Number Interpretation

AMC5 CNCs are marked with an identification label. The Catalogue number is explained as follows:



NOTE:

Do not under any circumstances tamper with these labels. Your warranty may be void if the labels are damaged.

Δ

# 4 Installation and Operation

### 4.1 Removing the Unit from the Packaging

Once the unit is received please do the following:

- Remove unit 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.

### 4.2 Installation Guidelines

The CNC unit is designed to be installed in an enclosure which remains closed during operation. The CNC unit may be installed in any orientation. M4 knurled screws are provided for mounting the unit. The cabinet layout should be arranged in such a way that:

- System identification labels and markings can be easily sighted
- Air flow within the cabinet is not restricted
- External cabling can be installed and accessed easily
- Ensure that the CNC is protected at all times from dust, heat and moisture



#### WARNING:

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.

# 4.3 Ventilation Spacing

When the CNC is installed in an enclosed cabinet please ensure adequate space for ventilation. The Ventilation Spacing is set 50 mm distance from each side edge.



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

# 4.4 Wiring Power to the Unit and Earthing Guidelines

Use correct wire sizes to connect to the power.

Pin	X122 Wire Size
ICN-3077-1004	1.5 ~ 1.0 mm <sup>2</sup>

Connect the CNC to a central earth point in the machine electrical cabinet.

The minimum standards for t	he wiring	connecting to t	the earth stu	ıd (X123)	are shown	below:
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Wire Gauge	2.0 mm <sup>2</sup>
Terminator	M5 Ring Lug
Torque	4 Nm

### 4.5 Powering the Unit

The CNC is designed to be powered by a  $24V_{DC}$  supply. The CNC also provides a  $12V_{DC}$  output for customer use (4A rating); this output may be used to power external devices such as LCD displays. This output voltage is commonly used to power the LCD screen on an ANCA Motion Front Panel.

Additionally a CNC\_ON 24V<sub>DC</sub> signal is provided from the CNC. This output will transition from 0V to 24V when the CNC is switched on and may be used to control the power initialisation of the machine, once the CNC has been switched off this output will transition from 24V to 0V.



This output is from the same supply line that powers the unit (PWRSUP\_+). Care must be taken to ensure the 0VDC supply line is the same potential as PWRSUP\_- when wiring this output.

### 4.5.1 Connector

NOTE:

8765	Pin	Signal	Pin	Signal
	1	CNC_ON	5	PWRSUP_+
	2	N/C	6	PWRSUP
	3	PWR_ENA	7	PWR_ENB
	4	12VDC_OUT	8	0VDC_OUT

The mating plug connector may be ordered from your local ANCA Motion sales branch or machine provider, see <u>3.5 Ordering Information</u>.

#### NOTE:

- 1. The power supply to the CNC unit must be protected with a 4A Circuit breaker.
- 2. The 12VDV\_OUT power supply is fully protected. It is only to be used for powering the CNC Pad display. If it is used for any other purposes, or if any other devices are added to it, unreliable behaviour may result, or the power supply may automatically shut down in self protection.

### 4.5.2 Power Enable Wiring



PWR\_ENA (Pin3) and PWR\_ENB (Pin 7) are 5V<sub>bc</sub> voltage level.
 If external power is connected on any of the pins it will cause

If external power is connected on any of the pins it will cause permanent damage to motherboard.

# 4.6 Switching the Unit On and Off

When power is supplied to the unit, it may be switched on by shorting **PWR\_ENA** and **PWR\_ENB** on connector X122 for longer than 0.25 seconds. Once the system is powered the **CNC\_ON** signal will transition from 0V to 24V, this signal may be used to automatically control the power start-up stage to the rest of the machine.

The system should only be switched off via the operating system. This will prevent data corruption on the system hard disk. Once the system has completely shut down the **CNC\_ON** signal will transition from 24V to 0V, this signal may be used to remove power from the rest of the machine.





# 4.7 Connecting External Devices to the CNC

When connecting any device to the CNC ensure both the device and CNC are not connected to a power supply. Ensure all relevant device documentation is read prior to 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 applying force to cables / wires to disconnect devices.



#### WARNING:

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

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



Figure 17 - Connecting Procedure

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# 5 Trouble Shooting

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

# 6 ANCA Motion Support and Service

Please Note that there are no user serviceable parts inside the CNC.

For Sales and Technical Support please contact one of the following offices

#### ANCA Motion Pty. Ltd.

1 Bessemer Road Bayswater North VIC 3153 AUSTRALIA Telephone: +61 3 9751 8900 Fax: +61 3 9751 8901 www.ancamotion.com/Contact-Us Email: sales.au@ancamotion.com

#### ANCA Motion China

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