AMI5000 Series Touchpad User Manual

AMDOC-000203 Rev 06

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AMI5000 Series Touchpad User Manual

Some Important Links

Related Manuals and Brochures: AMI5000 Touchpad	*Related Documentation*
Related Manuals and Brochures: AMI5000 Remote Pendant	*Related Documentation*
Sales and Support Contact Information	*Product, Sales and Service*
For the latest copy of the manual visit us online	*Manuals*

Some Important References

PMK Manual: Please refer to the latest PMK User Manual (version 9.01 or later)

Document Reference: AMDOC-000203 Rev 06

Effective:

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Chapter Summaries

Table of Contents

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1 Safety

1.1 General Safety

Warning: To prevent possible accidents or injury, ensure you read and understand this manual before commencing installation or commissioning work on the AMI5000 Touchpad.

This manual and the warnings attached to the Touchpad only highlight hazards that can be predicted by ANCA Motion. Be aware they do not cover all possible hazards.

ANCA Motion shall not be responsible for any accidents caused by the misuse or abuse of the device by the operator.

Safe operation of these devices is your own responsibility. By taking note of the safety precautions, tips and warnings in this manual you can help to ensure your own safety and the safety of those around you.

The following points must be understood and adhered to at all times:

- Equipment operators must read the user manual carefully and make sure of the correct procedure before operating the Touchpad.
- If two or more persons are working together, establish signals so that they can communicate to confirm safety before proceeding to another step.
- Always make sure there are no obstacles or people near the devices during installation and or operation. Be aware of your environment and what is around you.
- Take precautions to ensure that your clothing, hair or personal effects (such as jewellery) cannot become entangled in the equipment.
- Do not remove the rear cover to access the inside of the Touchpad unless authorized
- Do not turn on any of the equipment without all safety features in place and known to be functioning correctly.
- Never touch any exposed wiring, connections or fittings while the equipment is in operation.
- Do not apply any excessive mechanical force to the Touchpad, which may cause malfunction or failure.
- Keep the vicinity of the Touchpad clean and tidy.
- Never attempt cleaning or inspection during machine operation.
- ESD Safe Installation procedures should be followed.
- Only suitably qualified personnel should install, operate, repair and/or replace this equipment.
- Be aware of the closest First Aid station.
- Ensure all external wiring is clearly labelled. This will assist you and your colleagues in identifying possible electrical safety hazards.
- Clean or inspect the equipment only after isolating all power sources.
- Install cables according to local legislation and regulations as applicable.

2 Introduction

2.1 Purpose

This manual provides the required information for installing, commissioning and operating the AMI5000 Touchpad. It has been written specifically to meet the needs of qualified engineers, tradespersons, technicians and operators.

Every effort has been made to simplify the procedures applicable to the Touchpad in this manual. However, given the sometimes complex nature of the information, some prior knowledge of associated units, their configuration and or programming is assumed.

2.2 About the AMI5000 Touchpad

The AMI5000 Touchpad is used as a Human Machine Interface (HMI), which interfaces directly with the ANCA Motion Control System Software to support fast and flexible access for real-time control, in conjunction with the Handheld Remote Pendant. The Touchpad is designed to mount directly onto the Customer Machine and to connect directly to the (internal) Customer Machine CNC. The Touchpad is available in two mounting variants to support a Pivot or Mounting Arm format.

Please refer to *3.2 Features* for more details of the available features.

Figure 2-1 Touchpad: Front View - Pivot

Figure 2-2 Touchpad: Front View – Mounting Arm

2.3 Touchpad Variant Applicability

This manual is applicable to the following variants of the ANCA Motion AMI5000 Touchpad:

Product	Part Number
AMI5000 Touchpad: Pivot Variant	646-X-02-1100
AMI5000 Touchpad: Mounting Arm Variant	646-X-00-120Y

Table 1 Part Number

2.4 PMK Version Applicability

The supporting CNC (AMC5) PMK version applicable to the AMI5000 Touchpad is as follows:

CNC Version	PMK Version
AMC5 CNC	PMK 9.01 RC2.2 (or later)
AMC5 CNC G2	PMK 10.0 (or later)

Table 2 PMK Version

Refer to “D-000108_ANCA Motion CNC PMK Usage - Approved Usage List OEM Customers.pdf” document for the latest PMK version for your CNC

2.5 Terms and Abbreviations

Acronym	Description
AC / DC	Alternating Current / Direct Current
CNC	Computer Numerical Control
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
E-Stop	Emergency Stop Switch
GND	Ground
LCD	Liquid Crystal Display
LED	Light Emitting Diode
N/A	Not Applicable
NC	No Connection (Pin is not connected)
PCBA	Printed Circuit Board Assembly
PD2	Pollution Degree 2
PMK	Platform Maintenance Kit
USB	Universal Serial Bus

Table 3 Terms and Abbreviations

3 Product Overview

3.1 Introduction

This chapter introduces the reader to the Touchpad by providing the following information:

- Features
- Label configuration
- Product overview

3.2 Features

The ANCA Motion AMI5000 Touchpad has the following features:

- 19 inch LCD Display with resolution of 1024 x 1280 (H x V) in Portrait Mode
- Integrated Multipoint Touchpad Interface
- Variants to suit a Pivot or Mounting Arm mechanical mounting to allow flexible positioning
- Five dedicated Machine Operation Switches with LED Feedback
- Emergency Stop Switch
- Key Switch
- Three external USB Type A Ports for User supplied equipment
- Integrated audio system for User Feedback
- IP53 Protection Rating

3.3 AMI5000 Touchpad Product Label

The Touchpad is marked with a Product Label; the label configuration is shown below:

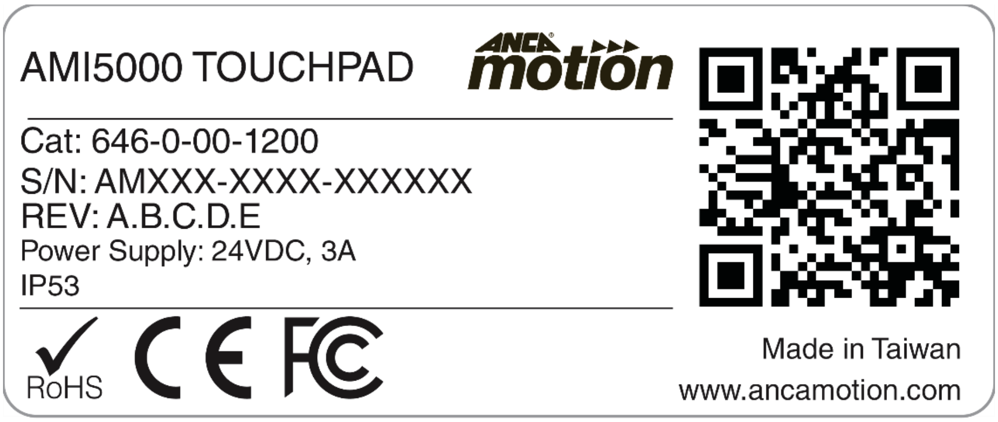

Figure 3-1 Touchpad Label

For any warranty work to be undertaken this label must be readable and undamaged. Care should be taken to record these numbers in a separate register in the event of damage or loss. The label can be found on the bottom face of the product.

Note: Do not under any circumstances tamper with this label. Your warranty may be void if the label is damaged.

3.4 AMI5000 Touchpad Part Number Interpretation

3.4.1 Pivot Variant

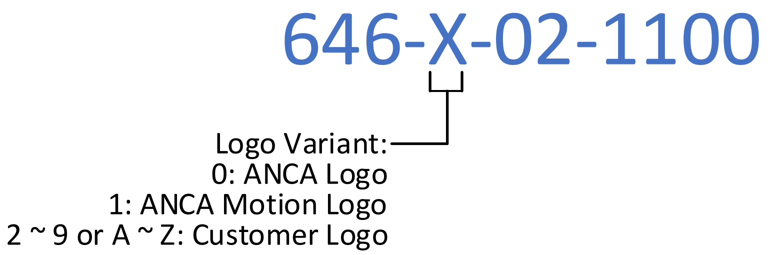

Figure 3-2 Pivot Variant Product Number Breakdown

3.4.2 Mounting Arm Variant

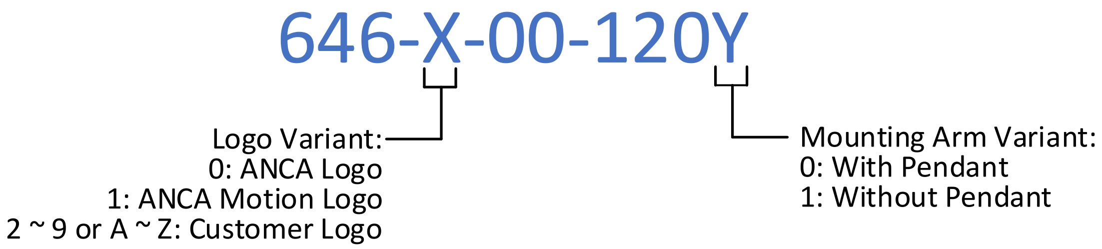

Figure 3-3 Mounting Arm Variant Product Number Breakdown

3.5 Touchpad Overview: Variants

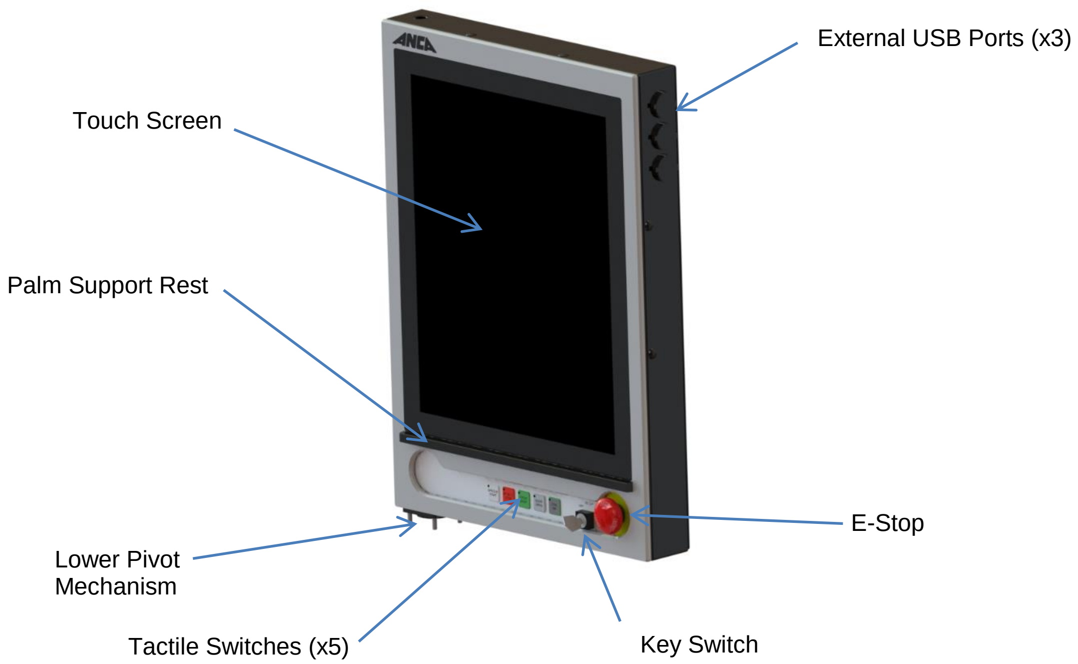

Figure 3-4 Overview Image of Touchpad – Pivot

Figure 3-5 Overview Image of Touchpad – Mounting Arm

These images show the location of the different controls on the AMI5000 Touchpad (refer to *3.2 Features*). The Touchpad interfaces with the CNC Control System through the Touchpad Interface Connectors which can be accessed by removing the Rear Cover of the Unit (see section *5 Electrical Installation* for more information)

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4 Mechanical Installation

4.1 Introduction

This chapter describes mounting the Touchpad:

- Pre installation checks
- Installation site requirements
- External Interface Cable Assemblies
- Mounting procedure

4.2 Pre-Installation Checks

- Prior to installing the panel, please refer to section *3.3 AMI5000 Touchpad Product Label* to ensure you have the correct variant for the application.
- Check that the Touchpad was not damaged during transport. Please notify your dealer immediately of damage, prior to beginning installation procedures.

4.3 Requirements

4.3.1 Installation Site

The following is a set of requirements on the installation site. Failure to follow these instructions may result in failure or degraded operation:

- The Touchpad must only be installed indoors.
- Refer to section *4.3.2 Mounting* for the correct installation process.
- The safety precautions outlined in section *1 Safety* must be understood and adhered to.
- The operating environment **must not** contain corrosive substances, metal particles, dust, condensation, flammable substances or gases.
- The Touchpad must not be installed in an environment in which the pollution degree exceeds PD2.
- ESD Safe Installation procedures should be followed.
- Ensure that the Power Supply to the Machine is in an OFF condition.

4.3.2 Mounting

The Touchpad can be mounted directly to the Customer Machine or mounted independently:

- The Pivot variant of the Touchpad rotates about a vertical axis with Upper and Lower Pivot components; the Touchpad can only be installed in a vertical orientation.
- The Mounting Arm Variant of the Touchpad fits to a (user supplied) Mounting Arm via the Rear Panel.
- The Touchpad is supplied with the Rear Cover partially attached to ease the delivery and installation process.
- Ensure that the hardware is tightened to the correct torque settings as specified in the Mechanical Installation procedure.

4.3.3 Accessory Box

Ensure that only supplied components are used for mounting and installing the Touchpad and its accessories – do not substitute alternatives.

4.3.3.1 Accessory Box: Pivot Variant

An Accessory Box is supplied with the Pivot variant of the Touchpad which contains the following mounting components:

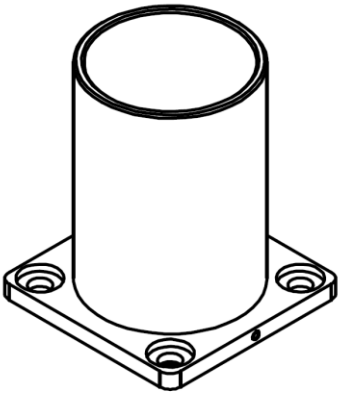
Part Number	Description	Quantity	Image
ICN-3001-3255	Screw Button Head Torx Key Flanged M4x8	10	
ICN-3001-3251	Socket Head Cap Screw Low Head M5x16mm	4	
646-0-00-8639	Lower Pivot Clamp Plate Assy	1	

Table 4 Accessory Box Contents: Pivot Variant

4.3.3.2 Accessory Bag: Mounting Arm Variant

An Accessory Bag is supplied with the Mounting Arm Variant of the Touchpad which contains the following mounting components:

Part Number	Description	Quantity	Image
ICN-3001-3255	Screw Button Head Torx Key Flanged M4x8	10	
ICN-3001-3289	SCREW BUTTON HEAD CAP M6x14mm	4	
ICN-3004-0106	WASHER FLAT M6 O.D 12mm	4	
ICN-3001-0361	COUNTERSUNK SOCKET SET SCREW M6x16mm	3	

Table 5 Accessory Bag Contents: Mounting Arm Variant

4.4 External Interface Cable Assemblies

4.4.1 Pivot Variant

This section provides guidance on the preparation of the external interface cable assemblies used for connection to the Pivot Variant of the Touchpad (refer to section *5 Electrical Installation* for additional information).

Cable Description:

Cable No	Cable Type	Format	Connector Format	Cable Preparation
3	Protective Earth	Single Wire	M5 Crimp Lug	Length 300 mm Fit Crimp Lug at one end
4	Protective Earth	Single Wire	M5 Crimp Lug	No preparation required
5	Video I/F	Native	HDMI - Male	No preparation required
6	PCBA: Power I/F	Single Wires	Molex Mini-Fit Jr. Receptacle Pins: 2 Part Number: 39-01-2020 Female Crimp: 39-00-0073	Outer Cable Insulation stripped back
7	PCBA: Switch I/F	Single Wires	Molex Mini-Fit Jr. Receptacle Pins: 12 Part Number: 39-01-2120 Female Crimp: 39-00-0073	Outer Cable Insulation stripped back
8	PCBA: USB I/F	Native	USB Type B Plug	No preparation required
9	E-Stop and Key Switch I/F	Single Wires	Molex Mini-Fit Jr. Plug Housing Pins: 8 Part Number: 39-01-2081 Male Crimp: 39-00-0075	Outer Cable Insulation stripped back

Table 6 Pivot Variant: External Interface Cable Description

Cable Format:

Cable No	Cable Type	Format	Length post Mounting Arm Port (mm)	Note
3	Protective Earth	Single Wire	N/A	Touchpad: Chassis to Rear Panel
4	Protective Earth	Single Wire	300 +0/-20	Machine to Touchpad Chassis
5	Video I/F	Native	500 +0/-20	
6	PCBA: Power I/F	Single Wires	200 +0/-20	
7	PCBA: Switch I/F	Single Wires	200 +0/-20	
8	PCBA: USB I/F	Native	200 +0/-20	
9	E-Stop and Key Switch I/F	Single Wires	200 +0/-20	

Table 7 Pivot Variant: External Interface Cable Format

Cable Routing Order:

Order	Cable No	Cable Type	Connection #1	Connection #2
1	3 & 4	Protective Earth	Machine Cabinet	Touchpad Chassis: Single M5 Lug
2	3	Protective Earth	Touchpad Rear Panel	
3	5	Video I/F	Machine Cabinet	Touchpad HDMI(F)
4	8	USB I/F	Machine Cabinet	PCBA: USB HOST (X3)
5	7	Switch I/F	Machine Cabinet	PCBA: SWITCH (X2)
6	9	E-Stop and Key Switch I/F	Machine Cabinet	E-Stop and Key Switch I/F Receptacle
7	6	Power I/F	Machine Cabinet	PCBA: D24V IN (X1)

Table 8 Pivot Variant: External Interface Cable Routing Order

Ancillary Components:

Part Number	Description	Quantity	Note
ICN-3083-0002	CABLE TIE 150 mm CT143	3	Cable Tie position A

Table 9 Pivot Variant: External Interface Cable Ancillary Components

Reference: Internal Touchpad Interface Connectors:

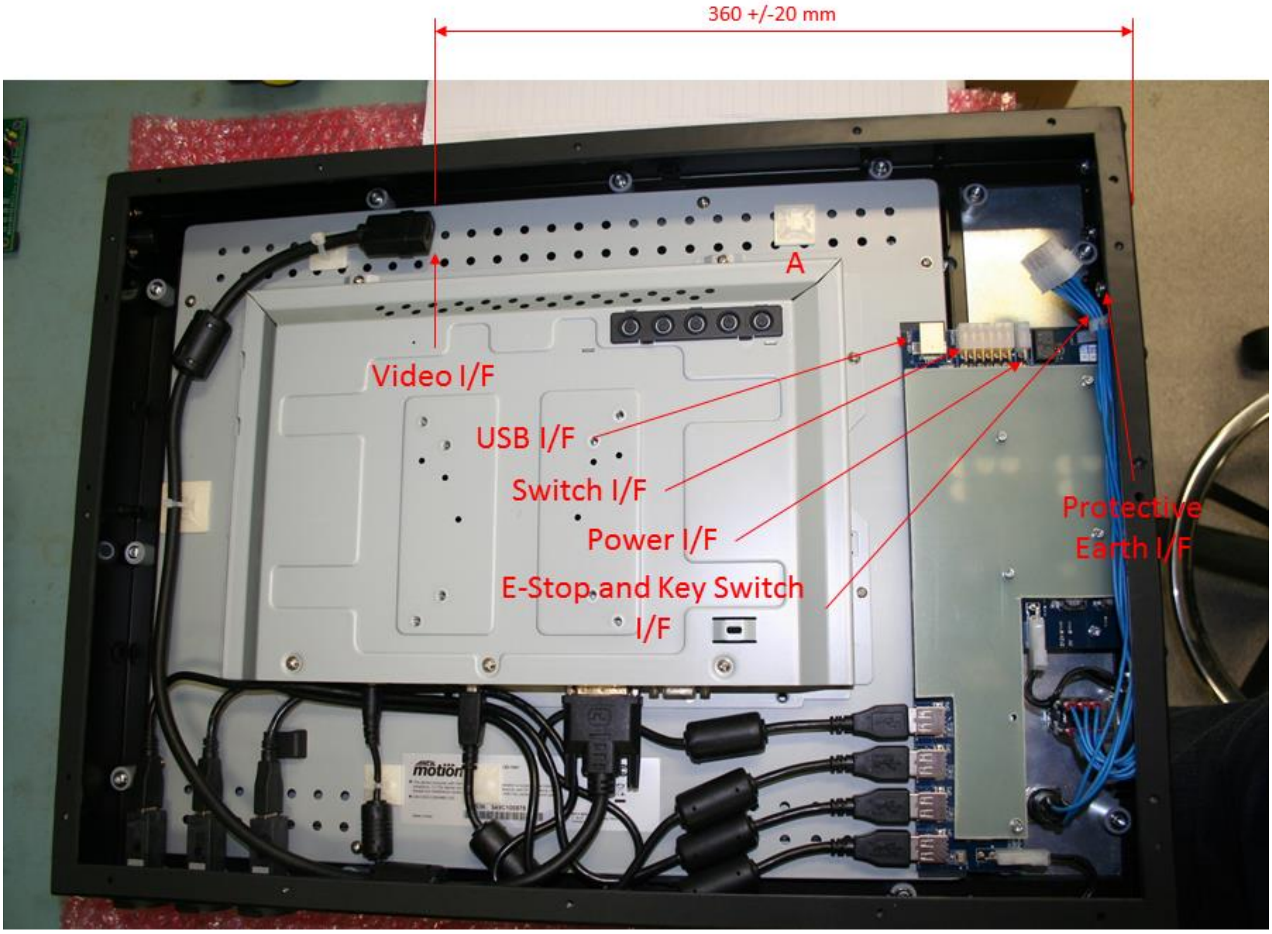


Figure 4-1 Pivot Variant: Internal Interface Connector Reference

4.4.2 Mounting Arm Variant

This section provides guidance on the preparation of the external interface cable assemblies used for connection to the Mounting Arm Variant of the Touchpad (refer to section *5 Electrical Installation* for additional information).

Cable Description:

Cable No	Cable Type	Format	Connector Format	Cable Preparation
1	Patch Panel: Safety I/F	Native	Phoenix: FK-MCP 1,5/10-ST-3,81	Outer Cable Insulation stripped back
2	Patch Panel: EtherCAT	Native	RJ45 8P8C modular connector	No preparation required
3	Protective Earth	Single Wire	M5 Crimp Lug	Length 300 mm Fit Crimp Lug at one end
4	Protective Earth	Single Wire	M5 Crimp Lug	No preparation required
5	Video I/F	Native	HDMI - Male	No preparation required
6	PCBA: Power I/F	Single Wires	Molex Mini-Fit Jr. Receptacle Pins: 2 Part Number: 39-01-2020 Female Crimp: 39-00-0073	Outer Cable Insulation stripped back
7	PCBA: Switch I/F	Single Wires	Molex Mini-Fit Jr. Receptacle Pins: 12 Part Number: 39-01-2120 Female Crimp: 39-00-0073	Outer Cable Insulation stripped back
8	PCBA: USB I/F	Native	USB Type B Plug	No preparation required
9	E-Stop and Key Switch I/F	Single Wires	Molex Mini-Fit Jr. Plug Housing Pins: 10 Part Number: 39-01-2101 Male Crimp: 39-00-0075	Outer Cable Insulation stripped back

Table 10 Mounting Arm Variant: External Interface Cable Description

Cable Format:

Cable No	Cable Type	Format	Length post Mounting Arm Port (mm)	Note
1	Patch Panel: Safety I/F	Native	300 +0/-20	
2	Patch Panel: EtherCAT	Native	300 +0/-20	
3	Protective Earth	Single Wire	N/A	Touchpad: Chassis to Rear Panel
4	Protective Earth	Single Wire	300 +0/-20	Machine to Touchpad Chassis
5	Video I/F	Native	500 +0/-20	
6	PCBA: Power I/F	Single Wires	350 +0/-20	
7	PCBA: Switch I/F	Single Wires	350 +0/-20	
8	PCBA: USB I/F	Native	300 +0/-20	
9	E-Stop and Key Switch I/F	Single Wires	300 +0/-20	

Table 11 Mounting Arm Variant: External Interface Cable Format

Cable Routing Order:

Order	Cable No	Cable Type	Connection #1	Connection #2
1	1	Patch Panel: Safety I/F	Machine Cabinet	Patch Panel: X2
2	2	Patch Panel: EtherCAT	Machine Cabinet	Patch Panel: X3
3	3	Protective Earth	Touchpad Rear Panel	Touchpad Chassis: Single M5 Lug
4	3 & 4	Protective Earth	Machine Cabinet	
5	5	Video I/F	Machine Cabinet	Touchpad HDMI(F)
6	6	Power I/F	Machine Cabinet	PCBA: D24V IN (X1)
7	7	Switch I/F	Machine Cabinet	PCBA: SWITCH (X2)
8	8	USB I/F	Machine Cabinet	PCBA: USB HOST (X3)
9	9	E-Stop and Key Switch I/F	Machine Cabinet	E-Stop and Key Switch I/F Receptacle

Table 12 Mounting Arm Variant: External Interface Cable Routing Order

Ancillary Components:

Part Number	Description	Quantity	Note
ICN-3083-0002	CABLE TIE 150 mm CT143	3	Cable Tie positions A, B and C

Table 13 Mounting Arm Variant: External Interface Cable Ancillary Components

Reference: Internal Touchpad Interface Connectors:

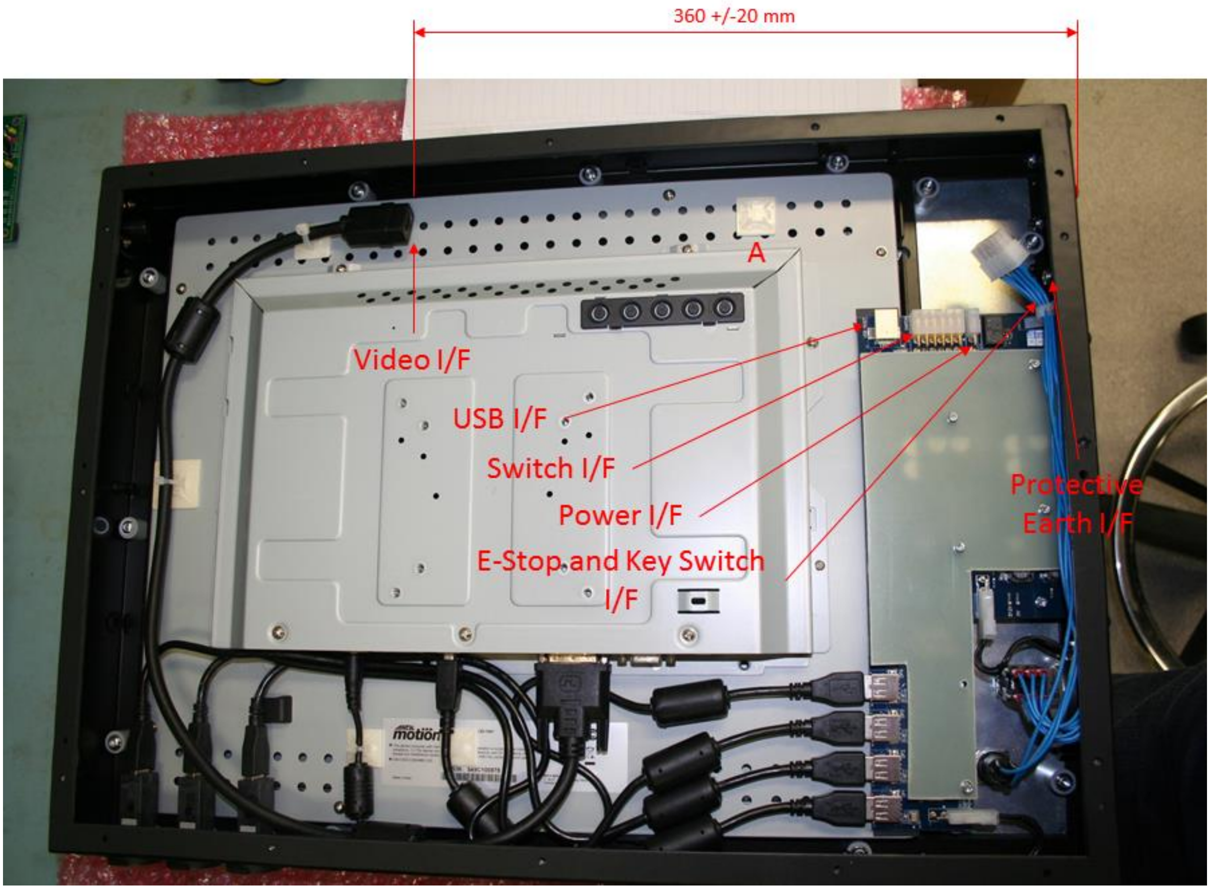


Figure 4-3 Mounting Arm Variant: Internal Interface Connector Reference

Reference: Cable Numbers:

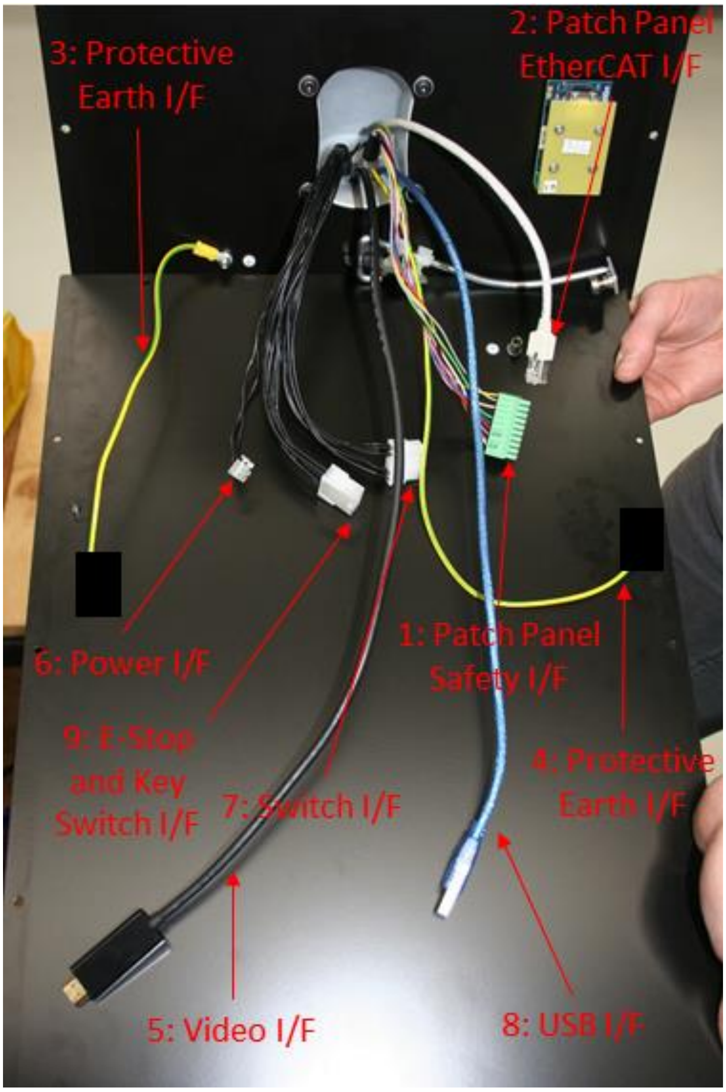


Figure 4-4 Mounting Arm Variant: Cable Number Reference

4.5 Installation

4.5.1 Mounting the Touchpad: Pivot Variant

Tools Required:

Description	Quantity	Note
Torque Wrench	1	Torque function required for assembly
2.5 mm Hex Driver	1	Installing the Rear Panel to the Touchpad
3.0 mm Hex Driver	1	Mounting the Lower Pivot mechanism to the Customer Machine
8 mm Socket	1	Tightening the M5 Earth Stud Nut Tightening the Hose Clamp onto the Pivot Bush

Table 14 Mounting the Touchpad: Tools Required

Parts Required:

Part Number	Description	Quantity	Note
646-X-02-1100	AMI5000 Touchpad	1	Unit to be installed onto the Machine
ICN-3001-3255	Screw Button Head Torx Key Flanged M4x8	12	Loosely supplied with 646-X-02-1100 (partially installed on 646-X-02-1100)
ICN-3001-3251	Socket Head Cap Screw Low Head M5x16mm	4	Loosely supplied with 646-X-02-1100
646-0-00-8639	Lower Pivot Clamp Plate Assy	1	Loosely supplied with 646-X-02-1100
ICN-3001-0444	Nyloc Nut M5	2	Partially installed on 646-X-02-1100
ICN-3048-0015	Hose Clamp Worm Drive Dia 30-45mm	1	Partially installed on 646-X-02-1100
N/A	Rear Panel Chassis Earth Cable	1	User supplied
646-0-00-8717	AMI5000 Touchpad Adaptor Cable	1	Supplied separately (use as required)
ICN-3083-0004	Adhesive Cable Tie Holders	2	Internal cable management
ICN-3083-0001	Plastic Cable Ties	2	Internal cable management

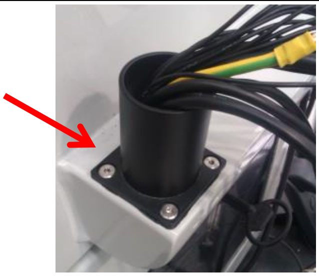
Table 15 Mounting the Touchpad: Parts Required

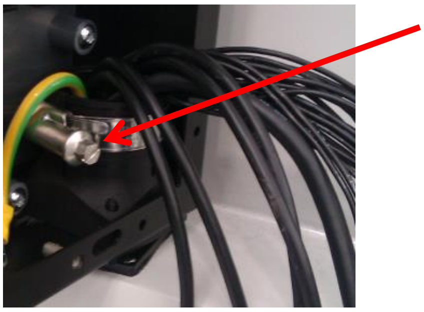
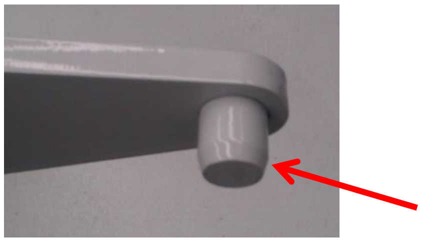
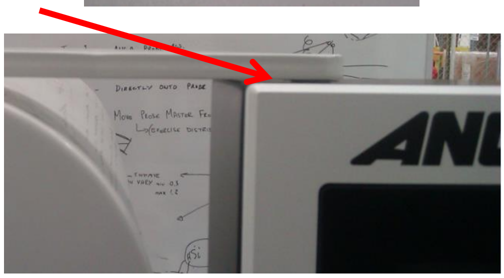
Tightening Torque:

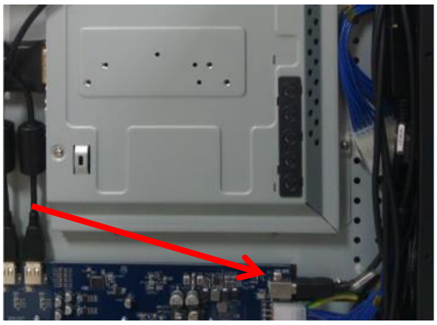
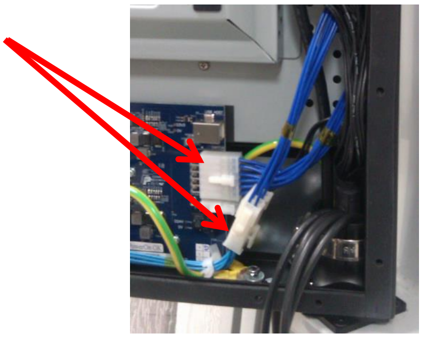
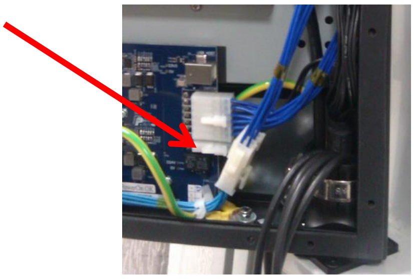
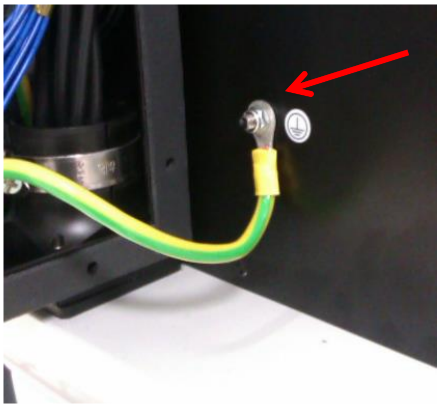
Part Number	Description	Torque (Nm)
ICN-3001-3255	Screw Button Head Torx Key Flanged M4x8	0.3
ICN-3001-3251	Socket Head Cap Screw Low Head M5x16mm	2.0
ICN-3001-0444	Nyloc Nut M5	1.0
ICN-3048-0015	Hose Clamp Worm Drive Diameter 30-45 mm	1.0

Table 16 Mounting the Touchpad: Tightening Torque

Installation Method:

Step	Description	Images
1	Ensure that the Power Supply to the Machine is in an OFF condition	
2	Carefully feed the Machine cables through the Lower Pivot Clamp Plate Assembly in the following order: Digital Video Interface (Cable 5) Switch Interface (Cable 7) E-Stop and Key Switch Interface (Cable 9) Power Interface (Cable 6) USB Interface (Cable 8) Machine Chassis Earth Interface (Cable 4) Ensure the Machine cables have sufficient length to satisfy the tail lengths detailed in *Table 7 Pivot Variant: External Interface Cable Format*.	
3	After all the cables have been fed through, fit the Lower Pivot Clamp Plate Assembly to the ledge of the Customer Machine by tightening the four M5 SHCS screws (ICN-3001-3251) to 2 Nm. *Note: When the Lower Pivot Clamp Plate Assembly is fitted to the ledge, ensure that the small pin that is evident on this plate is placed towards the rear as shown.*	
4	Remove the Rear Panel from the Touchpad to expose the internal structure. Safely store the Rear Panel and screws until later in the installation process.	
5	Remove the Upper Pivot Bracket from the Customer Machine (if fitted). Safely store these parts until later in the installation process.	
6	Carefully feed the Machine cables through the hole opening in the Touchpad located in the lower right corner (as viewed from the rear) in the following order: Digital Video Interface (Cable 5) Switch Interface (Cable 7) E-Stop and Key Switch Interface (Cable 9) Power Interface (Cable 6) USB Interface (Cable 8) Machine Chassis Earth Interface (Cable 4)	

Step	Description	Images
7	Carefully lower the Touchpad unit over the Lower Pivot Clamp Plate Assembly. Ensure that the Hose Clamp is centrally located between the guided undercuts on the plastic bush. Tighten the nut on the Hose Clamp as shown to 1 Nm.	
8	Guide the pin from the Upper Pivot Bracket into the bush opening that is available on the upper chassis of the Touchpad. Place the Upper Pivot Bracket back onto the Customer Machine. Note: Check that there is a small gap between the Upper Pivot Bracket and the Touchpad chassis.	 
9	Connect the Machine Chassis Earth Cable (#4) and the Rear Panel Chassis Earth Cable (#3 - supplied by the end user) to the Earth Stud located on the bottom of the Touchpad Main Chassis as shown. Ensure the two Earth Cable terminals are located between a Flat Washer and the M5 Nut on the Earth Stud and tighten the Nut to a torque of 1 Nm (refer to section 5.3 for further details). Also ensure that that the Protective Earth sticker is not obstructed.	
10A	Connect the Customer Machine Interface Cables to the associated internal Touchpad interfaces (refer to section *5.3 Wiring Diagram* for further details): • Digital Video (#5): HDMI Connector	

Step	Description	Images
10B	• USB Interface (#8): PCBA X3	
10C	• Switch Interface (#7): PCBA X2) • E-Stop and Key Switch Interface (#9)	
10D	• Power Supply (#6): PCBA X1	
11	Place the Touchpad Rear Panel on a Support close to the rear of the Main Chassis. Connect the loose end of the Earth Cable (#3) from the Main Chassis to the Rear Panel Earth Stud as shown. Ensure the Earth Cable is located between the Flat Washer and the Nut on the Earth Stud and tighten the Nut to a torque of 1 Nm (refer to section *5.3 Wiring Diagram* for further details).	

Step	Description	Images
12	Secure the Rear Panel to the Main Chassis using twelve screws (ICN-3001-3255) with a torque setting of 0.3 Nm. Tip: Secure the diagonal screws in first to locate the panel, then fit and tighten the remaining screws.	
13	Place the Touchpad Key into the Key Switch (store the spare Key in a secure location).	
14	Confirm the Rear Bump Stop prevents the Touchpad touching the Machine Chassis when the Touchpad is in the fully recessed position.	
15	Confirm that the Touchpad rotates freely with a degree of resistance about a vertical axis defined by the Upper and Lower Pivot components.	

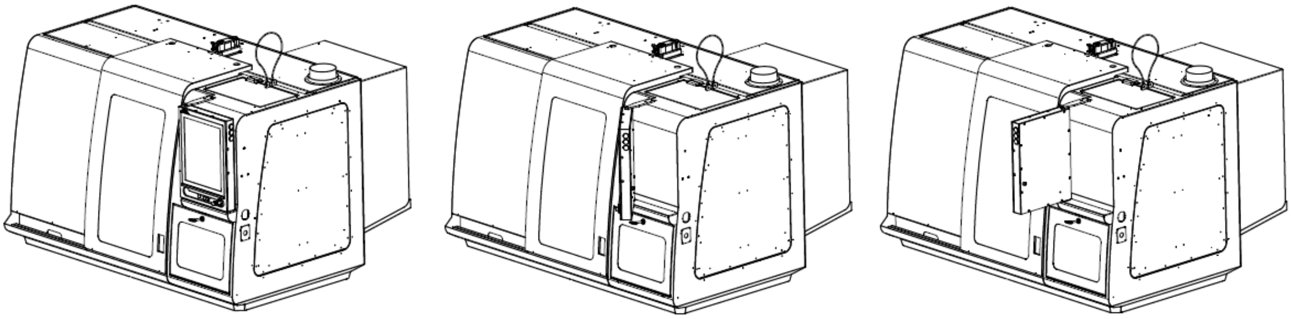


Figure 4-1 Typical installation of the AMI5000 Touchpad on a Customer Machine (also showing the range of rotation)

4.5.2 Mounting the Touchpad: Mounting Arm Variant

Tools Required:

Description	Quantity	Note
Torque Wrench	1	Torque function required for assembly
2.5 mm Hex Driver	1	Installing the Rear Panel to the Touchpad
3.0 mm Hex Driver	1	Tightening the Keyboard Tray to the chassis Tightening the Cradle Bracket to the chassis Tightening the Shipping Brackets to the chassis
4.0 mm Hex Driver	1	Tightening the Mounting Arm to the Rear Panel Tightening the Cradle to the Cradle Bracket

Table 17 Mounting the Touchpad: Tools Required

Parts Required:

Part Number	Description	Quantity	Note
646-X-00-1200	AMI5000 Touchpad	1	Unit to be installed onto the Machine
142.280.XXX XXX = cut length	Desk Coupling N, profiPLUS 50	1	Part to be ordered separately from Rolec
ICN-3001-3255	Screw Button Head Torx Key Flanged M4x8	12	Loosely supplied with 646-X-00-1200 (also partially installed)
ICN-3001-3289	SCREW BUTTON HEAD CAP M6x14 mm	4	Loosely supplied with 646-X-00-1200
ICN-3004-0106	WASHER FLAT M6 O.D 12 mm	4	Loosely supplied with 646-X-00-1200
ICN-3001-0361	C'SUNK SOCKET SET SCREW M6x16 mm	3	Loosely supplied with 646-X-00-1200
N/A	Rear Panel Chassis Earth Cable	1	User supplied
ICN-3083-0004	Adhesive Cable Tie Holders	As Required	Internal cable management
ICN-3083-0001	Plastic Cable Ties	As Required	Internal cable management

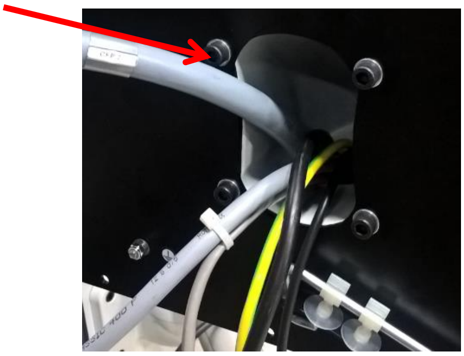
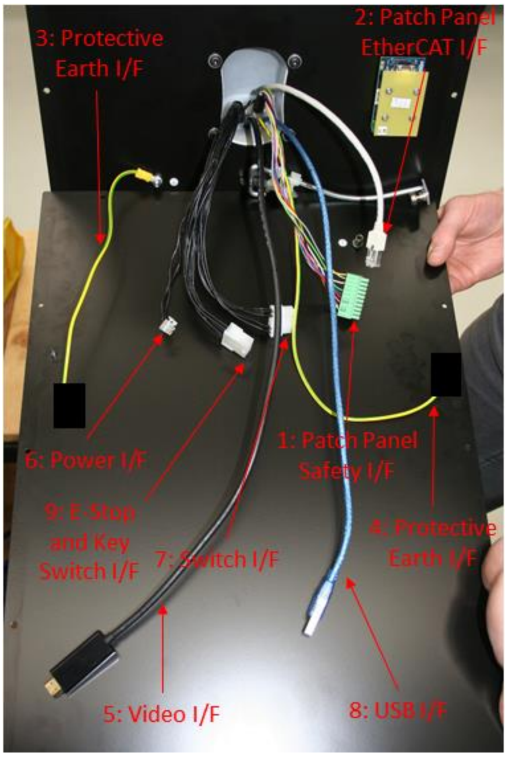
Table 18 Mounting the Touchpad: Parts Required

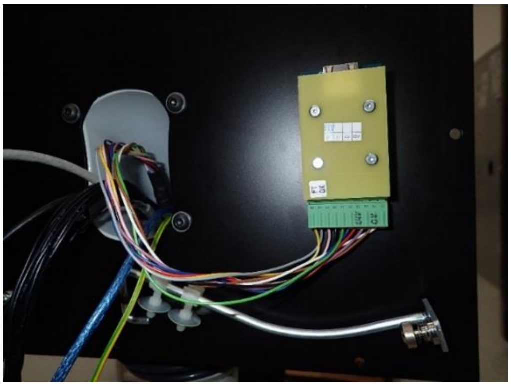
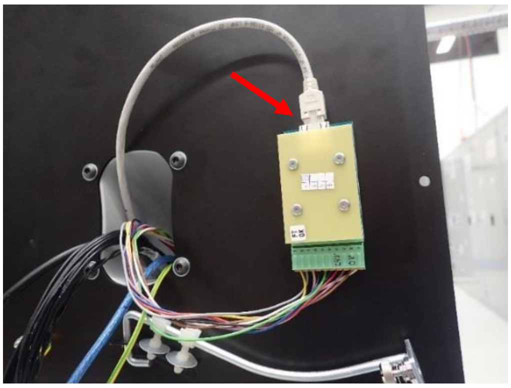
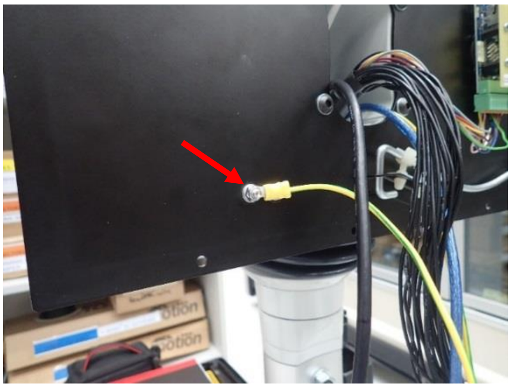
Tightening Torque:

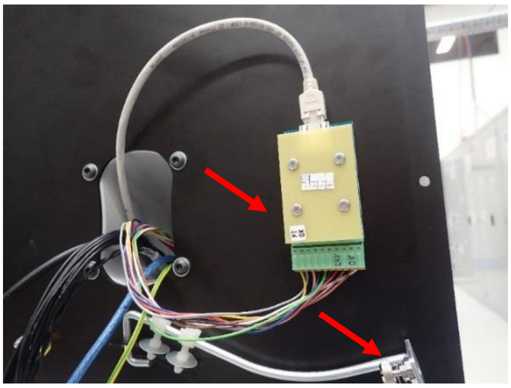
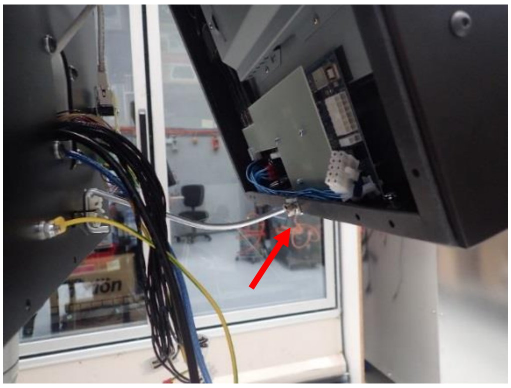
Part Number	Description	Torque (Nm)
ICN-3001-3255	Screw Button Head Torx Key Flanged M4x8	0.6
ICN-3001-3289	SCREW BUTTON HEAD CAP M6x14 mm	4.0 - 4.5
ICN-3001-0444	Nyloc Nut M5	1.0
ICN-3001-0361	COUNTERSUNK SOCKET SET SCREW M6x16 mm	N/A
ICN-3001-3288	SCREW BUTTON HEAD CAP M5x8 mm	1.5

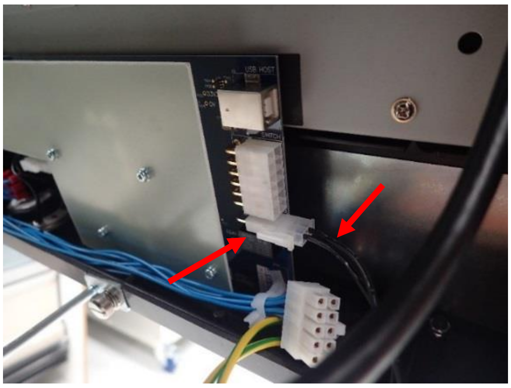
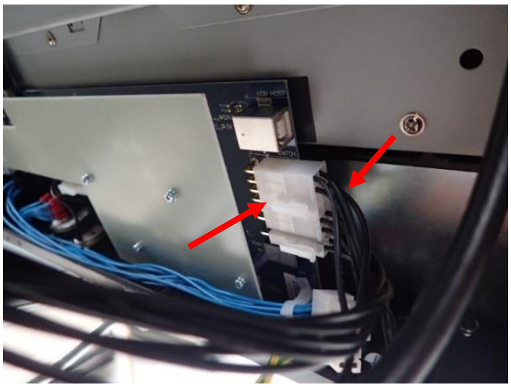
Table 19 Mounting the Touchpad: Tightening Torque

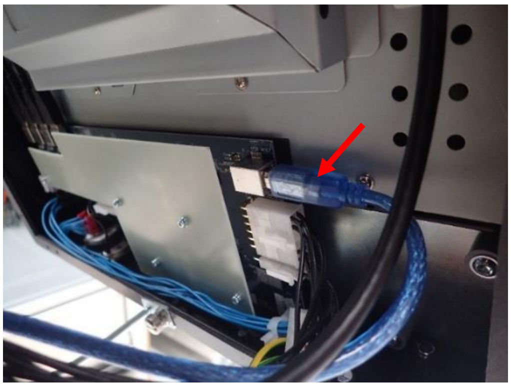
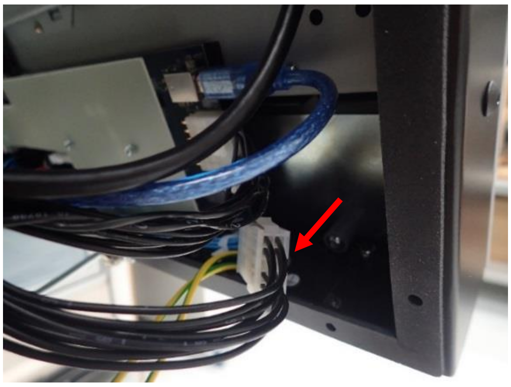
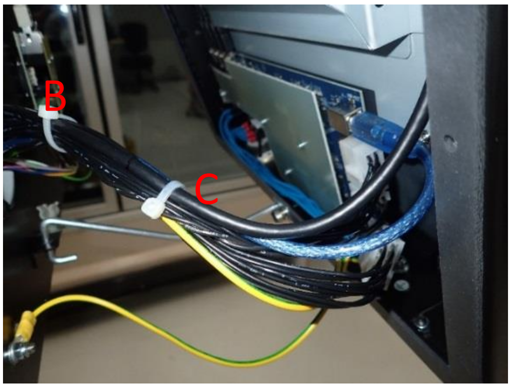
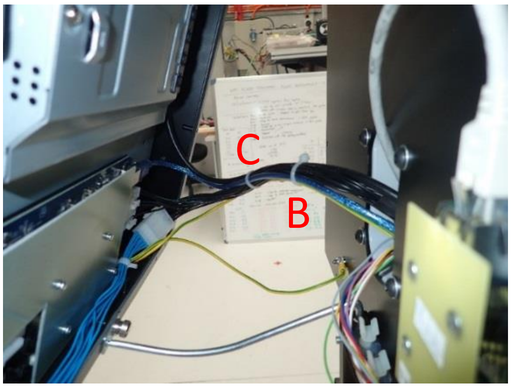
Installation Method:

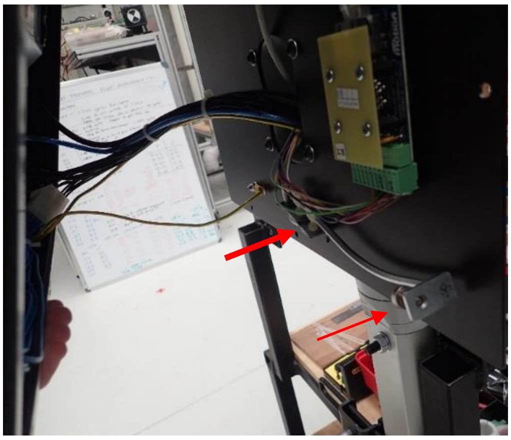
Step	Description	Images
1	Ensure that the Power Supply to the Machine is in an OFF condition	
2	Carefully feed the Machine cables through the Mounting Arm that is connected to the Machine : 1) Digital Video Interface 2) Switch Interface 3) E-Stop and Key Switch Interface 4) Power Interface 5) USB Interface 6) Machine Chassis Earth Interface 7) Patch Board Interface Ensure the Machine cables have sufficient length to satisfy the tail lengths detailed in *Table 11 Mounting Arm Variant: External Interface Cable Format*.	
3	Fit the Rear Panel Assembly to the Mounting Arm by tightening the four M6 screws to 4.0 - 4.5 Nm. Ensure that the flat washers are fitted between the screw head and the flat panel as shown. Note: The screw holes in the Rear Panel are slotted to allow small adjustments (if required) to the overall orientation.	
4	Check and confirm the grooming of the cables exiting from the Mounting Arm Port. Note that Cable 3 (Protective Earth I/F: Rear Panel to Chassis) is locally routed within the Touchpad Chassis and does not exit from the Mounting Arm Port All Cables should have a tail length of 300 +0/-20 mm, excluding Cable 5 (Video I/F) which requires a tail length of 500 +0/-20 mm, and Cables 6 and 7 (Power and Switch I/F) which require a tail length of 350 +0/-20 mm The Outer Cable Insulation should be stripped back (and secured with Heat Shrink) on the following Cables to match the tail length of 300 mm: 1: Patch Panel Safety I/F 6: Power I/F 7: Switch I/F 9: E-Stop and Key Switch I/F The relevant termination connectors should be fitted to each Cable.	

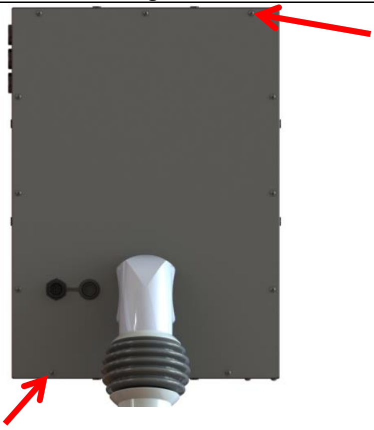
Step	Description	Images
5	Connect Cable 1 to the Patch Panel Safety Interface (X2).	
6	Connect Cable 2 to the Patch Panel EtherCAT Interface (X3).	
7	Connect Cable 3 to the Touchpad Rear Panel Protective Earth Stud using an M5 Crimp Lug. Ensure the Crimp Lug is located between the Flat Washer and the Nut on the Earth Stud (refer to section *5.3 Wiring Diagram* for further details). Orientate the Crimp Lug to face towards the Mounting Arm. Tighten the Nut to a torque of 1 Nm. The other end of Cable 3 will not be connected (NC) at this stage.	
8	Rotate the Mounting Arm joint so that the Rear Panel of the Touchpad is in a vertical orientation. Lock the Mounting Arm joint so it does not move prior to mounting. Lift the Touchpad chassis onto the Rear Panel and hook it on to the two small Z brackets located at the top of the Rear Panel door. The Touchpad chassis can now pivot from the top and open at the bottom as shown. Note: Care must be taken during the hooking of the Touchpad to the chassis to prevent damage to the surrounding gasket.	

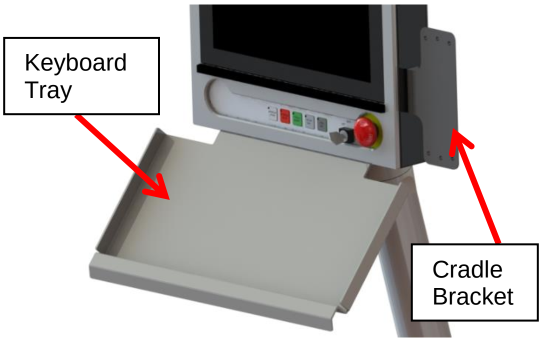
Step	Description	Images
9	Carefully remove the Rod Stay from the Rear Panel paying particular attention to the proximity of the Patch Board. Note: Ensure the Rod Stay does **not** contact the Patch Board during the removal process. Extend the Rod Stay and fix the M4 spring loaded fastener on the end of the Rod Stay to the blind nut located midway on the bottom lip of the Touchpad Chassis (as shown). Ensure this M4 Fastener is only **hand tightened** as the Rod Stay will be removed and stowed in its original position during a subsequent step in the installation process. The Touchpad will be held open due to the orientation of the Rod Stay.	 
10	Connect Cable 4 and the other end of Cable 3 to the Touchpad Chassis Protective Earth Stud, using a single M5 Crimp Lug. Ensure the Crimp Lug is located between the Flat Washer and the Nut on the Earth Stud (refer to section *5.3 Wiring Diagram* for further details). Orientate the Crimp Lug to face towards the Mounting Arm as shown. Tighten the Nut to a torque of 1 Nm.	

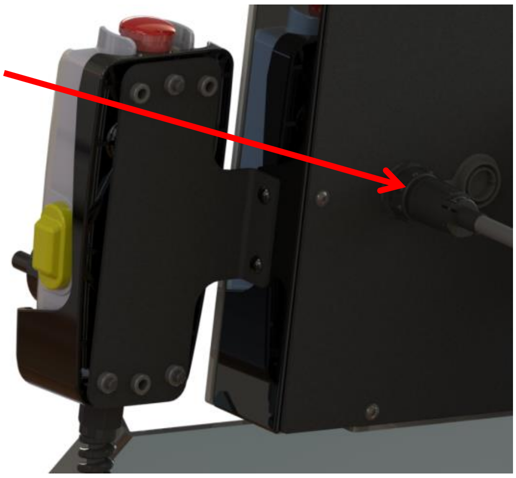
Step	Description	Images
11	Connect Cable 5 to the Display Video I/F: HDMI (F). Secure using a Cable Tie at position A.	 
12	Connect Cable 6 to the PCBA Power Interface Connector (D24V IN – X1). Ensure that the connector mating retention lug is in place.	
13	Connect Cable 7 to the PCBA Switch Interface Connector (SWITCH – X2). Ensure that the connector mating retention lug is in place.	

Step	Description	Images
14	Connect Cable 8 to the PCBA USB Host Interface Connector (USB HOST – X3).	
15	Connect Cable 9 to the Touchpad E-Stop and Key Switch Interface Connector. Ensure that the connector mating retention lug is in place.	
16	Groom Cables 4 – 9 by routing to the bottom of the Touchpad Chassis and then up to the Mounting Arm Port. Note this excludes Cables 1, 2 and 3. Ensure the Machine cables have sufficient cable relief. Secure with two Cable Ties located at position B (80 mm from the Mounting Arm Port) and position C (160 mm from the Mounting Arm Port).	 

Step	Description	Images
17	Remove the Rod Stay from the Main Chassis by loosening the M4 spring loaded fastener. Fit the Rod Stay securely to the Rear Panel using the two plastic clips as shown.	
18	Gently close the Touchpad Chassis against the Rear Panel. Ensure the interface cables are not caught between the Touchpad Chassis and Rear Panel mating surfaces, or underneath the PCBA Cover. The Cable Assembly will locate between the Mounting Arm Port, the PCBA Cover and the Display Rear Panel.	 

Step	Description	Images
19	Secure the Rear Panel to the Touchpad Chassis using twelve screws (ICN-3001-3255) with a torque setting of 0.6 Nm. Ensure the Touchpad Chassis is aligned against the Rear Panel. Tip: Secure the diagonal screws in first to locate the panel, then fit and tighten the remaining screws.	
20	For packing and transportation purposes shipping brackets can be used (customer designed items). If the Shipping Brackets are to be used, remove the four existing M5 Screws (two on the top and two on the bottom) from the Chassis and store in a safe location during transportation. These will be refitted to the Chassis once the Shipping Brackets have been removed to cover the internal Chassis nuts. Fit Shipping Brackets (similar as shown) to the upper and lower Chassis with new longer M5 Screws and tighten these to 1.5 Nm to match the blind threads nut inside the Chassis (the shipping brackets need to be designed so they fully support the Touchpad during transportation). Ensure that the contact interfaces of the Shipping Brackets to the Chassis are padded to provide protection from scratches during transport. Ensure the Rubber Bungs on the Touchpad Chassis are not damaged during the installation process.	 

Step	Description	Images
21	Fit the Keyboard Tray by initially removing the six M5 screws located on the bottom face of the Touchpad chassis (note that fitment access maybe improved by tilting the Touchpad rearwards on the Mounting Arm). Locate the Keyboard Tray to the underside of the chassis and then fit and tighten the six M5 screws to 1.5 Nm. Ensure the two Rubber Bungs on the bottom face of the Touchpad chassis are not damaged during the installation process. Fit the Cradle Bracket by initially removing the two M5 screws located on either the left side or right-side face of the Touchpad chassis, depending on the customer fitment option. Ensure the captive nuts on the rear of the Cradle Bracket are facing to the rear of the Touchpad and then fit and tighten the two M5 screws to 1.5 Nm. If the Keyboard Tray is not used, ensure the six M5 Bracket Screws located on the bottom face of the Touchpad chassis remain fitted. If the Cradle Bracket is not used, ensure the M5 Bracket Screws located on the left side and right-side face of the Touchpad chassis remain fitted.	 
22	Fit the Cradle to the Cradle Bracket by installing and then hand tightening the (supplied) three M6 counter sunk screws.	
23	Place the Remote Pendant onto the mounted Cradle fixture as shown.	

Step	Description	Images
24	Fit the Remote Pendant harness circular plug to the Patch Board Connector located on the Rear Panel as shown (store the red plug cover from the end of the harness in a secure location). Open the Dust Cap to expose the Patch Board Connector pins. Fit the Circular Plug of the harness into the Connector. Note: There is a locating pin for orientation purposes between the two mating connections. Once connected, rotate the locking nut on the cable end to complete the connection.	
25	Place the Touchpad Key into the Key Switch (store the spare Key in a secure location).	

5 Electrical Installation

5.1 Introduction

This chapter contains information that is useful in planning the electrical installation for the Touchpad:

- Interface Overview
- Wiring Diagram

The AMI5000 Touchpad must be installed by a professional. A professional in this context is a person or organisation possessing the necessary skills and qualifications relating to the installation and/or commissioning of control equipment, including their EMC aspects.

The AMI5000 Touchpad Electrical Interface consists of six/seven pre-wired cable assemblies from the Customer Machine, accessible via the Lower Pivot (Clamp Plate Assembly) or the Rear Panel Port, depending on the Touchpad variant:

- PCBA based interface:
  - Power Interface: Single Cable with +24Vdc and 0Vdc feed
  - Switch Interface: Twelve Way Single Cable Assembly
  - USB Interface: Single USB Cable
- E-Stop and Key Switch Interface: Eight/Ten Way Single Cable Assembly (depending on the Touchpad variant)
- Digital Video Interface: Single CNC Display Port to HDMI-M Cable Assembly
- Customer Machine Chassis Earth Interface: Single Cable Feed
- Patch Board Interface: Dedicated EtherCAT and Safety Interface Cable Assemblies (Mounting Arm Variant only)

The Touchpad Board provides the Power, Switch and USB Interfaces, whilst a HDMI Adaptor provides the Digital Video Interface to the Touchpad Screen. A separate interface is provided for the Emergency Stop and Key Switch functions, along with a dedicated Chassis Earth connection. The Mounting Arm Variant includes a separate Patch Board for the Remote Pendant interface.

5.2 Interface Overview

5.2.1 AMI5000 Touchpad Board

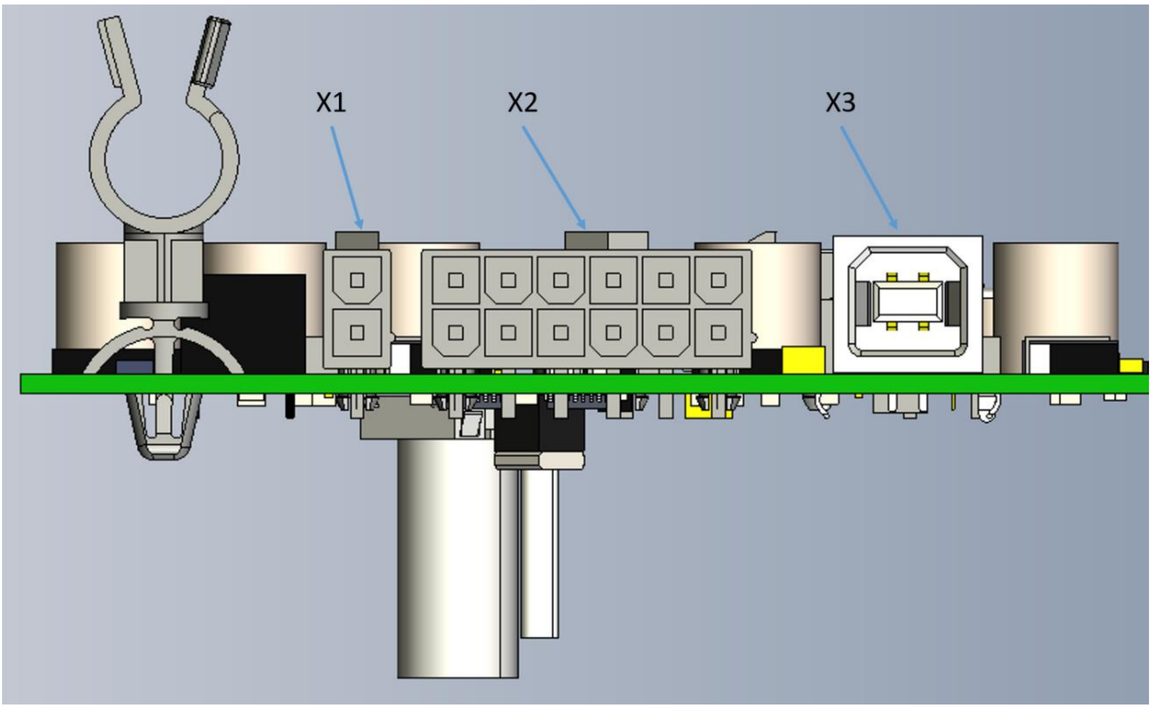


Figure 5-1 Interface Connectors on the Touchpad Board

As shown in *Figure 5-1 Interface Connectors on the Touchpad Board*, the Touchpad Board contains three interface connectors on the right-hand side of the Board which are accessed from the rear of the Touchpad Unit:

- X1: Power Interface
- X2: Switch Interface
- X3: USB Host (Upstream) Interface

Further information on the Touchpad Board Switch Interface is detailed in section *10.4 Switch Interface.*

5.2.1.1 Power Interface: X1

PCBA Connector	Designator	Function	Mating Connector
Molex Mini-Fit Jr. Header, Pins: 2 Part Number: 39-30-1021	X1	Supplies power to the Touchpad PCBA and the Touch Screen	Molex Mini-Fit Jr. Receptacle, Pins: 2 Part Number: 39-01-2020 Female Crimp: 39-00-0073

5.2.1.1.1 Pin Assignment

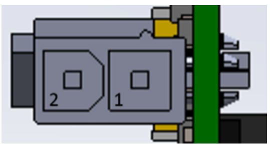
Connector: X1	Pin Number	Label	Description
	1	EXT 24VDC	+24V IN
	2	EXT 0VDC	0V IN

Table 20 Power Interface Pin Assignment (viewed from mating side)

5.2.1.2 Switch Interface: X2

PCBA Connector	Designator	Function	Mating Connector
Molex Mini-Fit Jr. Header, Pins: 12 Part Number: 39-30-1121	X2	Provides the five Tactile Switch signals, the five LED signals and the Latch signal	Molex Mini-Fit Jr. Receptacle, Pins: 12 Part Number: 39-01-2120 Female Crimp: 39-00-0073

5.2.1.2.1 Pin Assignment

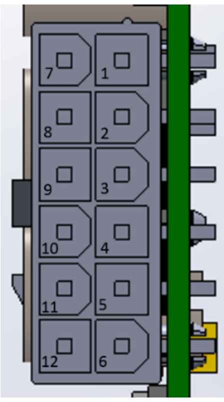
Connector: X2	Pin Number	Label	Description
	1	SW1_OUT	Switch 1 Contact Out
	2	SW1_IN	Switch 1 Contact In
	3	SW2_OUT	Switch 2 Contact Out
	4	SW3_OUT	Switch 3 Contact Out
	5	SW4_OUT	Switch 4 Contact Out
	6	SW5_OUT	Switch 5 Contact Out
	7	SW1_HOLD_OPEN	Hold Switch 1 Contact Loop Open
	8	LED1_IN	LED 1 Input
	9	LED2_IN	LED 2 Input
	10	LED3_IN	LED 3 Input
	11	LED4_IN	LED 4 Input
	12	LED5_IN	LED 5 Input

Table 21 Switch Interface Pin Assignment (viewed from mating side)

5.2.1.3 USB Interface: X3

PCBA Connector	Designator	Function	Mating Connector
USB Type B Socket	X3	USB Host (Upstream)	USB Type B Plug

5.2.1.3.1 Pin Assignment

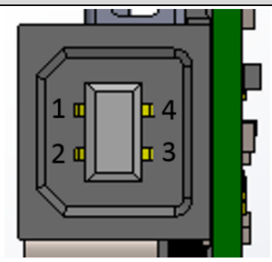
Connector: X3	Pin Number	Label	Description
	1	+5V VBUS	+5V VBUS from the CNC Host USB port
	2	D-	Data -
	3	D+	Data +
	4	GND	GND from the CNC Host USB port

Table 22 USB connector Pin Assignment (viewed from mating side)

5.2.2 **E-Stop and Key Switch Interface Connector**

5.2.2.1 **Touchpad: Pivot**

As shown in *Figure 5-2*, the E-Stop and Key Switch Interface is achieved via an eight way Connector located near the right hand edge of the PCBA, which passes from the E-Stop and Key Switch via two Cable Standoffs.

Connector	Designator	Function	Mating Connector
Molex Mini-Fit Jr. Receptacle, Pins: 8 Part Number: 39-01-2080	N/A	Provides connectivity to the Emergency Stop function and the Key Switch function (single contact set)	Molex Mini-Fit Jr. Plug Housing, Pins: 8 Part Number: 39-01-2081 Male Crimp: 39-00-0075

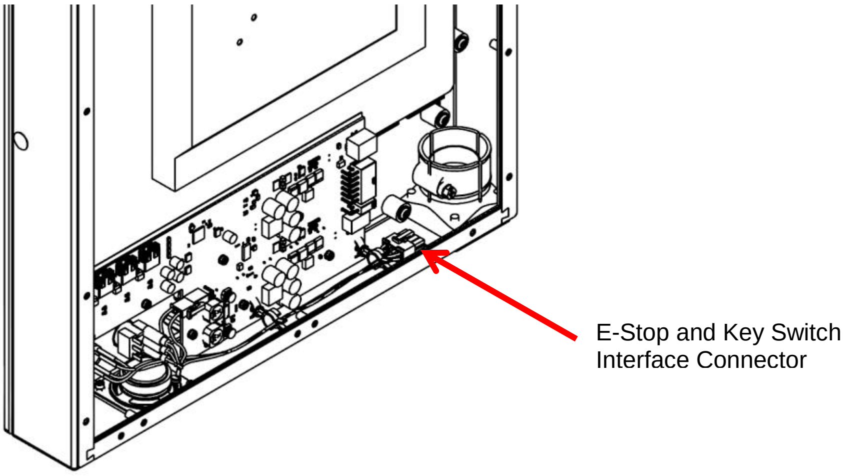


Figure 5-2 E-Stop an Key Switch Interface Connector: Pivot Variant (viewed from the rear of the unit)

5.2.2.1.1 Pin Assignment

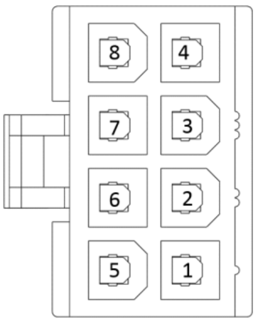
Connector: Safety	Pin Number	Label	Description
	1	KSW1_COM	Key Switch: Common
	2	KSW1_NO	Key Switch: Normally Open
	3	ESTOP_NC1_2	E-Stop: Normally Closed 1 - Contact 2
	4	ESTOP_NC2_2	E-Stop: Normally Closed 2 - Contact 2
	5	ESTOP_NC1_1	E-Stop: Normally Closed 1 - Contact 1
	6	ESTOP_NC2_1	E-Stop: Normally Closed 2 - Contact 1
	7	NC	No Connect
	8	KSW1_NC	Key Switch: Normally Closed

Table 23 E-Stop and Key Switch Interface Pin Assignment: Pivot Variant 646-0-02-1100 (viewed from mating side)

5.2.2.2 **Touchpad: Mounting Arm**

As shown in *Figure 5-3*, the E-Stop and Key Switch Interface is achieved via a ten way Connector located near the right hand edge of the PCBA, which passes from the E-Stop and Key Switch via two Cable Standoffs.

Connector	Designator	Function	Mating Connector
Molex Mini-Fit Jr. Receptacle, Pins: 10 Part Number: 39-01-2100	N/A	Provides connectivity to the Emergency Stop function and the Key Switch function (two contact sets)	Molex Mini-Fit Jr. Plug Housing, Pins: 10 Part Number: 39-01-2101 Male Crimp: 39-00-0075

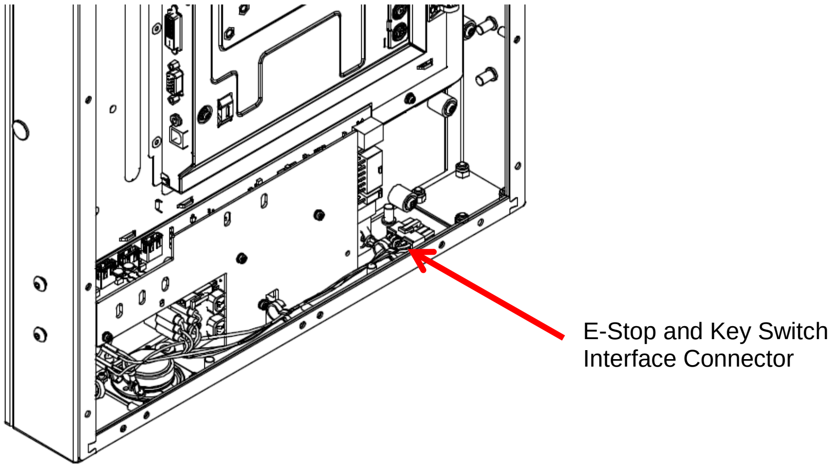


Figure 5-3 E-Stop and Key Switch Interface Connector: Mounting Arm Variant (viewed from the rear of the unit)

5.2.2.2.1 Pin Assignment

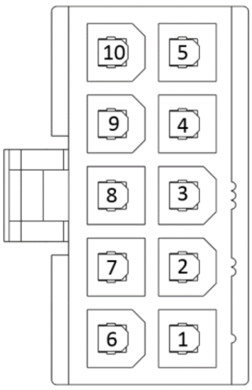
Connector: Safety	Pin Number	Label	Description
	1	KSW1_COM	Key Switch: Contact Set 1: Common
	2	KSW1_NO	Key Switch: Contact Set 1: Normally Open
	3	ESTOP_NC1_2	E-Stop: Normally Closed 1 - Contact 2
	4	ESTOP_NC2_2	E-Stop: Normally Closed 2 - Contact 2
	5	KSW2_COM	Key Switch: Contact Set 2: Common
	6	ESTOP_NC1_1	E-Stop: Normally Closed 1 - Contact 1
	7	ESTOP_NC2_1	E-Stop: Normally Closed 2 - Contact 1
	8	KSW2_NC	Key Switch: Contact Set 2: Normally Closed
	9	KSW1_NC	Key Switch: Contact Set 1: Normally Closed
	10	KSW2_NO	Key Switch: Contact Set 2: Normally Open

Table 24 Switch Interface Pin Assignment: Mounting Arm Variant (viewed from mating side)

5.2.2.3 Touchpad: Pivot (646-2-02-1100)

As shown in *Figure 5-4*, the E-Stop Interface is achieved via a ten-way Connector located near the right hand edge of the PCBA, which passes from the E-Stop via two Cable Standoffs.

Connector	Designator	Function	Mating Connector
Molex Mini-Fit Jr. Receptacle, Pins: 10 Part Number: 39-01-2100	N/A	Provides connectivity to the Emergency Stop function	Molex Mini-Fit Jr. Plug Housing, Pins: 10 Part Number: 39-01-2101 Male Crimp: 39-00-0075

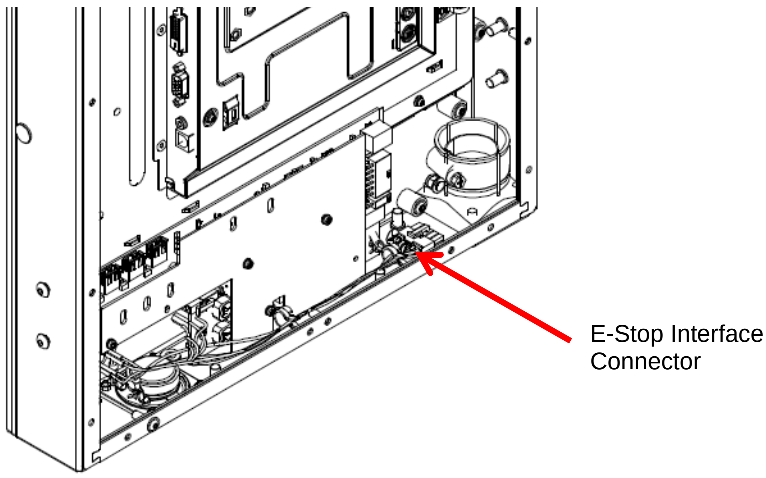


Figure 5-4 E-Stop Interface Connector: Pivot type 646-2-02-1100 (viewed from the rear of the unit)

5.2.2.3.1 Pin Assignment

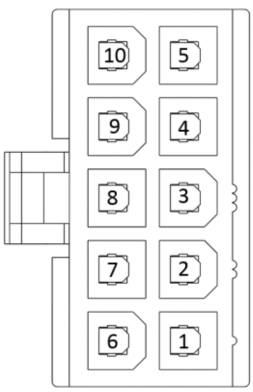
Connector: Safety	Pin Number	Label	Description
	1	NC	No Connect
	2	NC	No Connect
	3	ESTOP_NC1_2	E-Stop: Normally Closed 1 - Contact 2
	4	ESTOP_NC2_2	E-Stop: Normally Closed 2 - Contact 2
	5	NC	No Connect
	6	ESTOP_NC1_1	E-Stop: Normally Closed 1 - Contact 1
	7	ESTOP_NC2_1	E-Stop: Normally Closed 2 - Contact 1
	8	NC	No Connect
	9	NC	No Connect
	10	NC	No Connect

Table 25 Switch Interface Pin Assignment: Pivot Variant 646-2-02-1100 (viewed from mating side)

5.2.3 Digital Video Interface Connector

As shown in *Figure 5-5*, the Touchpad Digital Video Interface is achieved via a HDMI Adaptor located on the right-hand side of the rear of the Unit, which connects to the DVI-D connector on the rear of the Touch Screen.

Connector/Adaptor	Designator	Function	Mating Connector
HDMI - Female	N/A	Display Digital Video Interface	HDMI - Male

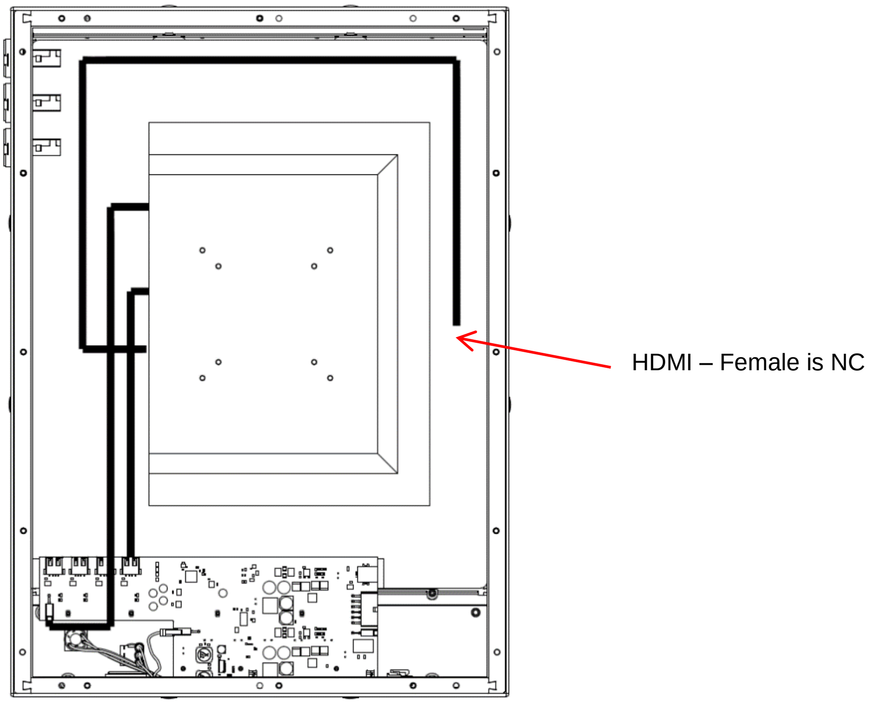


Figure 5-5 Digital Video Interface Connector on the Touchpad (viewed from the rear of the unit)

5.2.4 Customer Machine Chassis Earth Connection

As shown in *Figure 5-6*, the Chassis Earth connection between the Touchpad and the Customer Machine is achieved via an M5 Earth Stud (with M5 Nyloc Nut) located on the right hand internal side of the rear of the Unit. This also serves as the connection point for a short (user supplied) Chassis Earth connection to the M5 Earth Stud (with M5 Nyloc Nut) located at the rear bottom edge of the Touchpad Rear Panel.

Connector	Designator	Function	Mating Connector
M5 Stud with M5 Nyloc Nut	N/A	Provides connectivity to the Customer Machine Safety Connection	Crimp Ring Terminal: M5 Combine with M5 Flat Washer

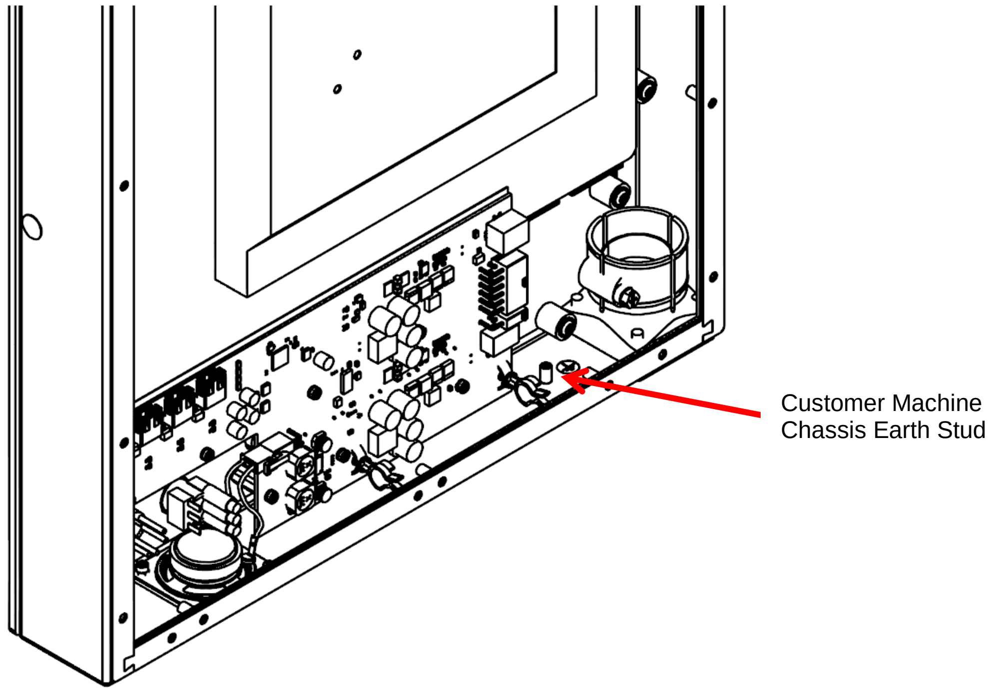


Figure 5-6 Customer Machine Chassis Earth Stud (viewed from the rear of the unit)

5.3 Wiring Diagram

Figure 5-7 shows the Wiring Diagram between the Host CNC, Customer Machine and the Touchpad:

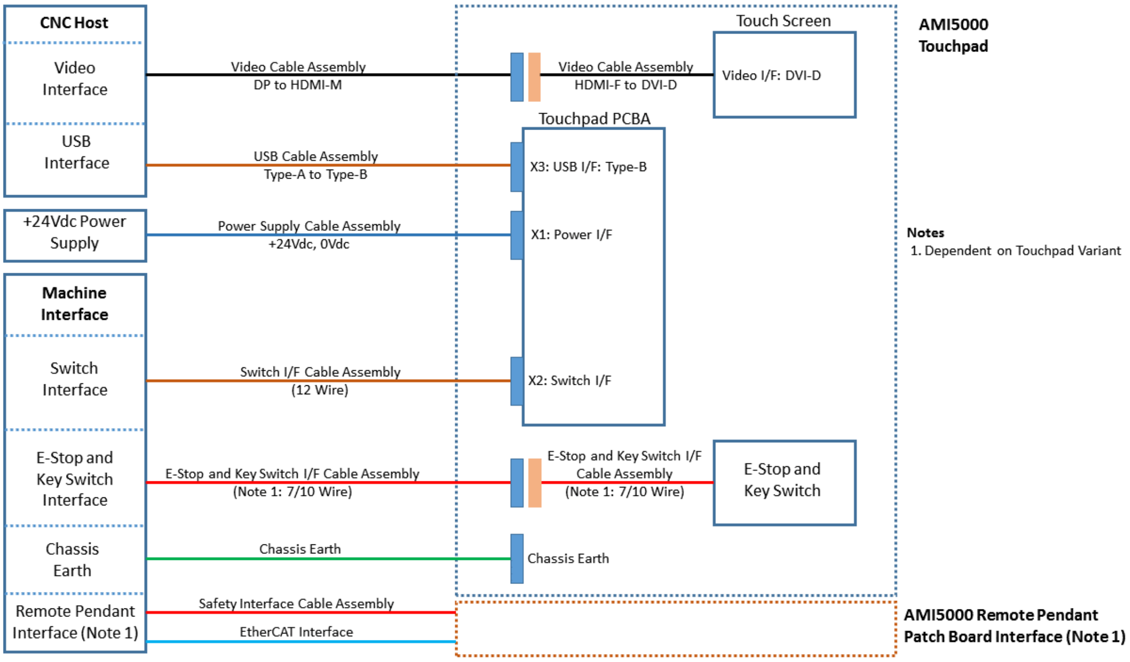


Figure 5-7 Touchpad Wiring Diagram

The Touchpad Electrical Installation should proceed in the following order:

1. Patch Board Interface
2. Customer Machine Chassis Earth: Main Touchpad Chassis connection
3. Digital Video Interface
4. USB Interface
5. Power Interface
6. Switch Interface
7. E-Stop and Key Switch Interface
8. Customer Machine Chassis Earth: Touchpad Rear Panel connection

To reduce the impact of electrical noise, the Touchpad chassis should be correctly earthed, and the Touchpad Interface wiring should be segmented and routed according to the needs of the system.

5.3.1 Touchpad Wiring: Patch Board Interface

Refer to the Remote Pendant User Manual for the format and rating of the EtherCAT and Safety Interface Cable Assemblies.

The EtherCAT and Safety Interface wiring is supplied by the end user.

Ensure that the external 24VDC Power Supply is OFF.

Fit the EtherCAT and Safety Interface Cable Assemblies as detailed in the Remote Pendant User Manual.

This will then allow completion of the Unit Installation procedure detailed in section *4.5 Installation.*

5.3.2 Touchpad Wiring: Customer Machine Chassis Earth: Chassis

The Machine Chassis Earth Cable should be a single cable with an M5 Crimp Ring Terminal.

The Machine Chassis Earth Cable is supplied by the end user along with the associated M5 Flat Washer.

A short (150 mm) Rear Panel Chassis Earth Cable is also required with an M5 Crimp Ring Terminal at each end.

The Rear Panel Chassis Earth Cable is supplied by the end user.

Ensure that the external +24VDC Power Supply is OFF.

The Machine Chassis Earth Cable and the Rear Panel Chassis Earth Cable should connect to the M5 Earth Stud located on the right-hand internal side of the rear of the Unit, using the integral M5 Nut and user supplied M5 Flat Washer.

The other end of the Rear Panel Chassis Earth Cable will be connected to the Touchpad Rear Panel later in the installation process as described in section *5.3.8 Touchpad Wiring: Customer Machine Chassis Earth: Rear Panel.*

Ensure that the Touchpad chassis is correctly earthed to minimise the impact of any noise in the overall system.

5.3.3 Touchpad Wiring: Digital Video Interface

The Digital Video Interface Cable should be a single cable with HDMI-Male Termination.

The Digital Video Interface Cable is supplied by the end user.

Ensure that the external +24VDC Power Supply is OFF.

The Digital Video Interface Cable should connect to the HDMI-Female Adaptor on the top right-hand side of the rear of the Unit (with appropriate routing and strain relief).

5.3.4 Touchpad Wiring: USB Interface

The USB Interface Cable should be a single cable with a Type-B Termination.

The USB Interface Cable is supplied by the end user.

Ensure that the external +24VDC Power Supply is OFF.

The USB Interface Cable should connect to the X3 connector on the Touchpad PCBA (with appropriate routing and strain relief).

5.3.5 Touchpad Wiring: Power Supply

The external +24VDC Power Supply for the Touchpad should be able to supply a minimum of 3A at +24Vdc.

The Power Supply feed should be a single cable with +24Vdc and 0Vdc connections (or a combination of separate cables).

The Power Supply wiring is supplied by the end user (note that a variety of Demonstration Looms are also available – refer to section *14.8 Demonstration Wiring Loom*).

Ensure that the external +24VDC Power Supply is OFF.

The Power Supply Cable should connect to the X1 connector on the Touchpad PCBA (with appropriate routing and strain relief).

5.3.6 Touchpad Wiring: Switch Interface

The Switch Interface Cable should be rated appropriately for each connection (nominal 24Vdc 200mA).

The Switch Interface Cable should be a single twelve-way cable (or a combination of separate cables).

The Switch Interface wiring is supplied by the end user (note that a variety of Demonstration Looms are also available – refer to section *14.8 Demonstration Wiring Loom*).

Ensure that the external +24Vdc Power Supply is OFF.

The Switch Interface Cable should connect to the X2 connector on the Touchpad PCBA (with appropriate routing and strain relief).

5.3.7 Touchpad Wiring: E-Stop and Key Switch Interface

The E-Stop and Key Switch Interface Cable should be rated appropriately for each connection (nominal 24Vdc 200mA).

The format of the E-Stop and Key Switch Interface Cable is dependent on the Touchpad variant:

- Pivot: Single eight-way cable
- Mounting Arm: Single ten-way cable

Alternatively, a combination of separate cables could be used.

The E-Stop and Key Switch Interface wiring is supplied by the end user (note that a variety of Demonstration Looms are also available – refer to section *14.8 Demonstration Wiring Loom*).

Ensure that the external +24Vdc Power Supply is OFF.

The E-Stop and Key Switch Interface Cable should connect to the eight/ten pin Connector located near the Cable Standoff on the right-hand bottom edge of the PCBA (with appropriate routing and strain relief).

5.3.8 Touchpad Wiring: Customer Machine Chassis Earth: Rear Panel

Ensure that the external +24Vdc Power Supply is OFF.

As described in section *5.3.1 Touchpad Wiring: Patch Board Interface*, one end of the Rear Panel Chassis Earth Cable has already been connected to the M5 Earth Stud located on the right hand internal side of the rear of the Unit.

The other end of the Rear Panel Chassis Earth Cable should be connected to the M5 Earth Stud located on the internal side of the Touchpad Rear Panel using the integral M5 Nut and user supplied M5 Flat Washer.

6 Unit Removal from Customer Machine

6.1 Introduction

This chapter describes the removal of the Touchpad from a typical Customer Machine:

- Site requirements
- Removal procedure

6.2 Site Requirements

The following is a set of requirements on the removal site:

- The safety precautions outlined in *1 Safety* must be understood and adhered to.
- Ensure that the Power Supply to the Machine is in an OFF condition.

6.3 Removal Procedure: Pivot Variant

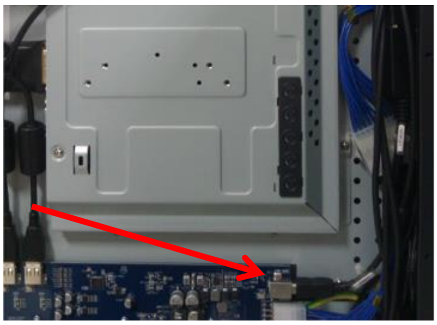
Tools Required:

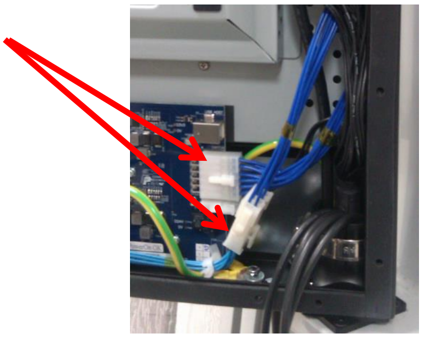
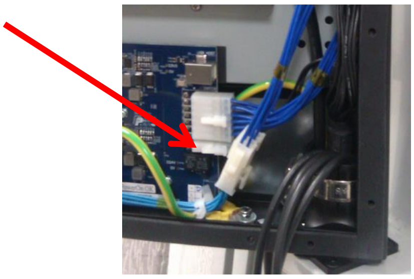
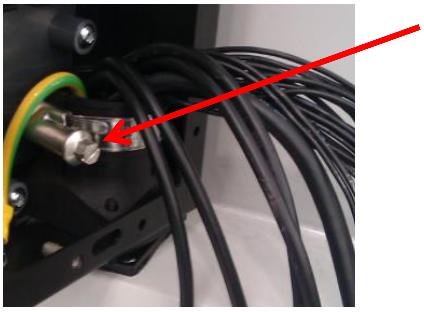
Description	Quantity	Note
Socket Wrench	1	Required for disassembly
2.5 mm Hex Driver	1	Remove the Rear Panel from the Touchpad
3.0 mm Hex Driver	1	Remove the Lower Pivot mechanism from the Customer Machine
8 mm Socket	1	Loosen the M5 Earth Stud Nut Loosen the Hose Clamp on the Pivot Bush

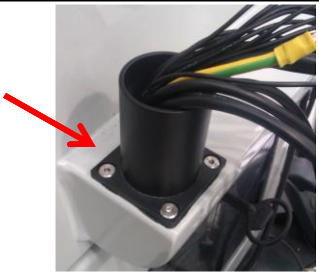
Table 26 Touchpad Removal: Tools Required

Removal Method:

Step	Description	Images
1	Ensure that the Power Supply to the Machine is in an OFF condition.	
2	Ensure the Touchpad Key is placed in the Key Switch.	

Step	Description	Images
3	Separate the Touchpad Rear Panel from the Main Chassis by removing and storing the twelve locating screws. Carefully lower the Rear Panel onto a nearby horizontal support.	
4	Disconnect the Rear Panel Earth Cable from the Earth Stud located on the inside bottom of the Rear Panel. Safely store the Rear Panel.	
5A	Carefully disconnect the Customer Machine Interface Cables in the following order: • Digital Video: HDMI Connector/Assembly	
5B	• USB Interface: PCBA X3	

Step	Description	Images
5C	• Switch Interface (PCBA X2) and E-Stop and Key Switch Interface	
5D	• Power Supply Interface: PCBA X1	
6	Disconnect the Machine Chassis Earth Cable and the Rear Panel Chassis Earth Cable from the Earth Stud located on the bottom of the Touchpad Main Chassis (as shown).	
7	Release the nut on the Hose Clamp (as shown).	

Step	Description	Images
8	Rotate the Touchpad Chassis to a position perpendicular to the Machine. Whilst holding the Touchpad Chassis in position, remove the Machine Upper Pivot Plate from the Machine by carefully removing the mounting bolts. Store the Upper Pivot Plate carefully.	 
9	Carefully lift the Touchpad Chassis upwards to clear the Lower Pivot Clamp Plate Assembly. Hold the Touchpad Chassis in position close to the Lower Pivot Clamp Plate Assembly. Carefully extract the Machine Interface Cables from the Touchpad in the following order: 1) Machine Chassis Earth Interface 2) USB Interface 3) Power Interface 4) E-Stop and Key Switch Interface 5) Switch Interface 6) Digital Video Interface	
10	If required, the Lower Pivot Clamp Plate Assembly can be removed from the Customer Machine by loosening the four M5 SHCS screws (ICN-3001-3251).	

Step	Description	Images
11	Carefully extract the Machine cables through the Lower Pivot Clamp Plate Assembly in the following order: 1) Machine Chassis Earth Interface 2) USB Interface 3) Power Interface 4) E-Stop and Key Switch Interface 5) Switch Interface 6) Digital Video Interface	

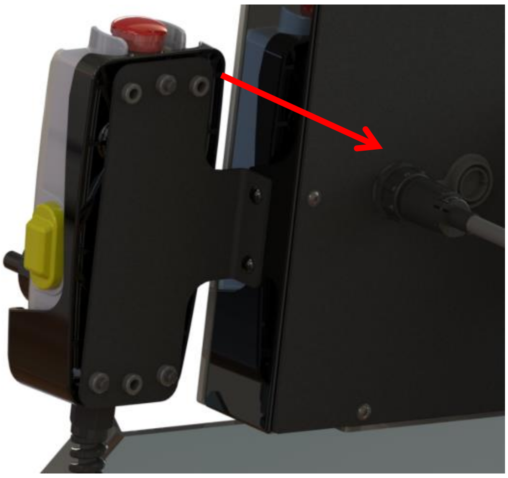
6.4 Removal Procedure: Mounting Arm Variant

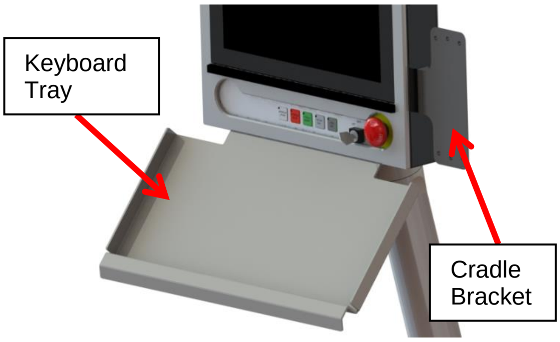
Tools Required:

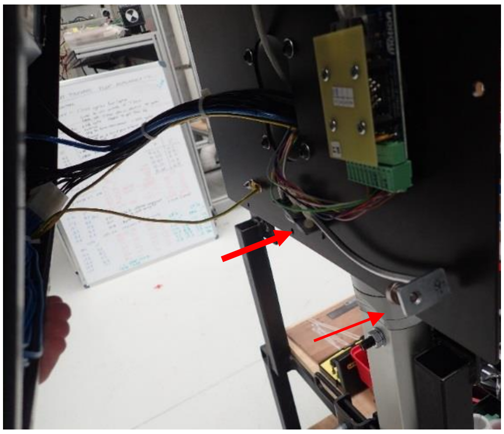
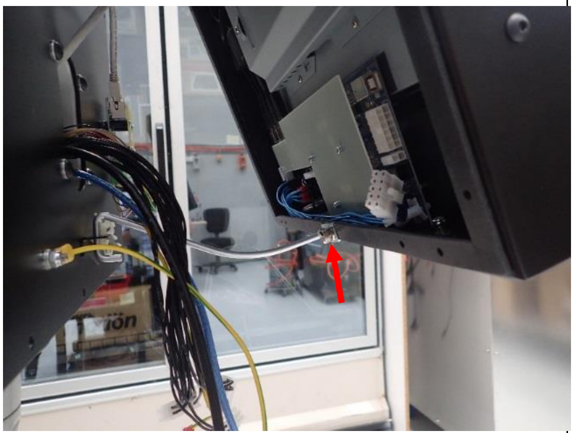
Description	Quantity	Note
Socket Wrench	1	Required for disassembly
2.5 mm Hex Driver	1	Remove the Rear Panel from the Touchpad
3.0 mm Hex Driver	1	Remove the Keyboard Tray from the chassis Remove the Cradle Bracket from the chassis
4.0 mm Hex Driver	1	Release the Mounting Arm from the Rear Panel Remove the Cradle from the Cradle Bracket
8 mm Socket	1	Loosen the M5 Earth Stud Nut

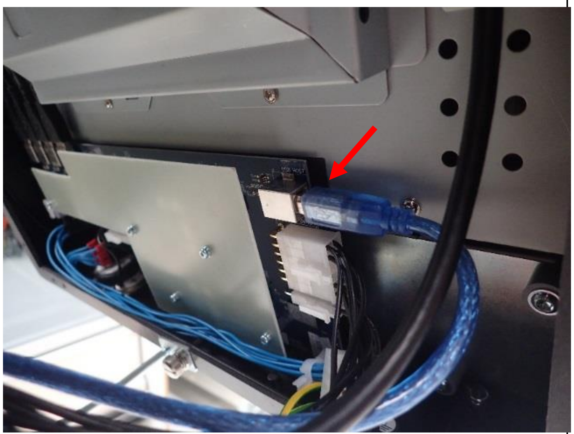
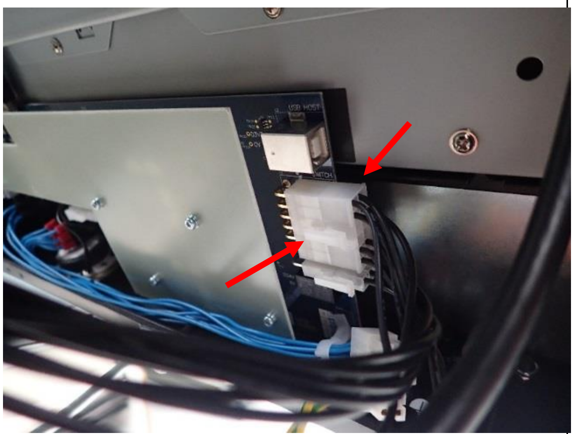
Table 27 Touchpad Removal: Tools Required

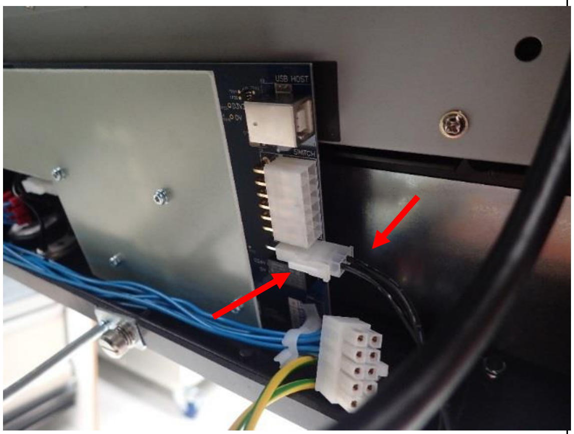
Removal Method:

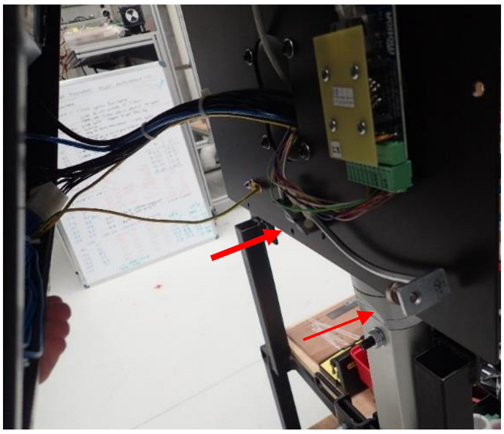
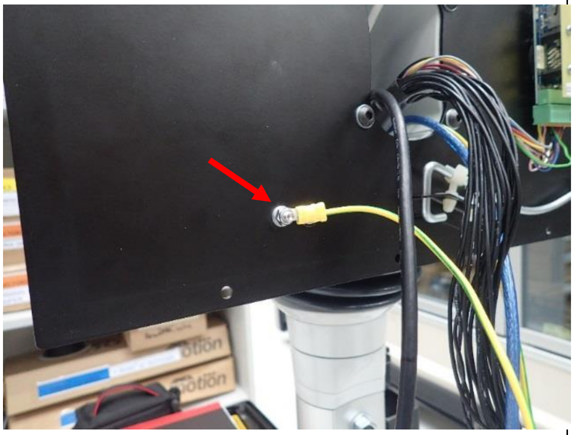
Step	Description	Images
1	Ensure that the Power Supply to the Machine is in an OFF condition.	
2	Ensure the Touchpad Key is placed in the Key Switch.	
3	Remove the Remote Pendant harness plug from the Patch Board connector located on the Rear Panel as shown and refit the red plug cover from the cable end (previously stored).	

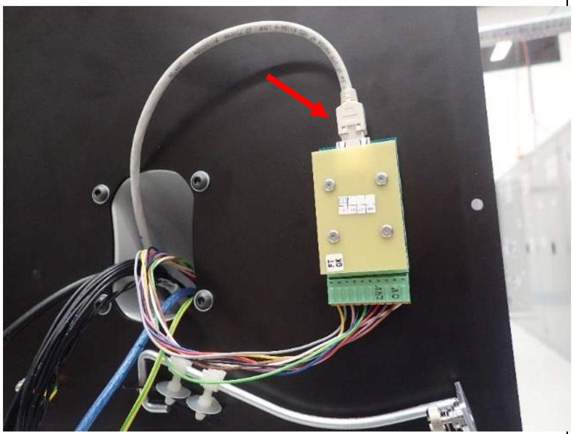
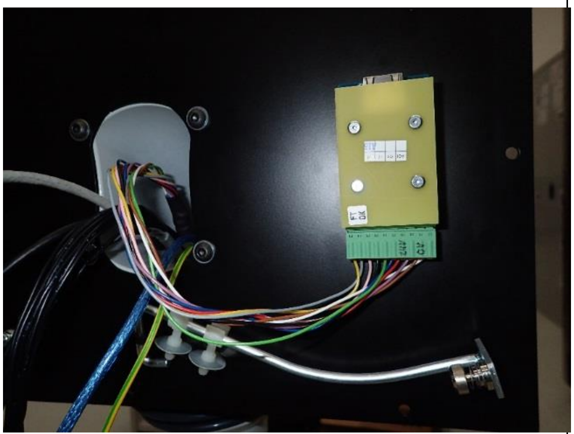
Step	Description	Images
4	Remove the Remote Pendant from the Cradle fixture.	
5	Detach the Keyboard Tray by removing the six M5 screws located on the bottom face of the Touchpad chassis. Store the Keyboard Tray and then refit and hand tighten the six M5 screws. Detach the Cradle Bracket by removing the two M5 screws located on either the left side or right side face of the Touchpad chassis, depending on the customer fitment option. Store the Cradle Bracket and then refit and hand tighten the two M5 screws.	 
6	Rotate the Mounting Arm joint so that the Rear Panel of the Touchpad is in a vertical orientation. Separate the Touchpad Rear Panel from the Main Chassis by removing and storing the twelve M4 locating screws.	

Step	Description	Images
7	Gently open the Touchpad Chassis from the lower side, pivoting against the top of the Rear Panel. Carefully remove the Rod Stay from the Rear Panel paying particular attention to the proximity of the Patch Board. Note: Ensure the Rod Stay does **not** contact the Patch Board during the removal process. Extend the Rod Stay and fix the M4 spring loaded fastener on the end of the Rod Stay to the blind nut located midway on the bottom lip of the Touchpad Chassis (as shown). Ensure this M4 Fastener is only **hand tightened** as the Rod Stay will be removed and stowed in its original position during a subsequent step in the removal process. The Touchpad will be held open due to the orientation of the Rod Stay.	  

Step	Description	Images
8A	Carefully disconnect the Customer Machine Interface Cables in the following order: Touchpad E-Stop and Key Switch Interface Connector	
8B	PCBA USB Host Interface Connector (USB HOST – X3)	
8C	PCBA Switch Interface Connector (SWITCH – X2)	

Step	Description	Images
8D	PCBA Power Interface Connector (D24V IN – X1)	
8E	Video I/F: HDMI (F) The associated Cable Tie at position A will also need to be removed.	 
8F	Disconnect the Machine Chassis Earth Cable and the Rear Panel Chassis Earth Cable from the Earth Stud located on the bottom of the Touchpad Main Chassis.	

Step	Description	Images
9	Remove the Rod Stay from the Main Chassis by loosening the M4 spring loaded fastener. Fit the Rod Stay securely to the Rear Panel using the two plastic clips as shown.	
10	Confirm that the Mounting Arm joint is rotated so that the Rear Panel of the Touchpad is in a vertical orientation. Lift the Touchpad chassis up and away from the Rear Panel and store safely. Note: Care must be taken during the removal of the Touchpad chassis from the Rear Panel to prevent damage to the surrounding gasket.	
11	Disconnect the Rear Panel Chassis Earth Cable from the Earth Stud located on the Touchpad Rear Panel.	

Step	Description	Images
12A	Carefully disconnect the Customer Machine Interface Cables in the following order: Patch Panel EtherCAT Interface (X3)	
12B	Patch Panel Safety Interface (X2)	
13	Remove the Rear Panel Assembly from the Mounting Arm by removing the four M6 screws, and carefully feeding the Machine cables through the Rear Panel cutout. Store the Rear Panel carefully, along with the four M6 screws and washers.	

7 E-Stop and Key Switch

7.1 Connection of the E-Stop and Key Switch

The Touchpad contains two switches which are located at the bottom right hand corner of the Touchpad:

- E-Stop (Emergency Stop) Switch
- Key Switch

These two devices are wired from the Touchpad to the Customer Machine via a user supplied cable (refer to section *5.3.6Touchpad Wiring: Switch Interface*).

The user can connect to the switches via a separate eight/ten pin Connector located near the Cable Standoff on the right-hand bottom edge of the Touchpad PCBA.

The interface used for connection of the E-Stop and the Key Switch is normally supplied with the Customer Machine.

7.2 E-Stop Switch Configuration

The E-Stop Switch consists of three contact pairs (NC1, NC2 and NC3) with two of these contact pairs (NC1 and NC2) being available on the E-Stop and Key Switch Interface.

Each contact pair consists of two connections:

- Contact Pair NC1: ESTOP_NC1_1 and ESTOP_NC1_2
- Contact Pair NC2: ESTOP_NC2_1 and ESTOP_NC2_2

Both contact pairs are normally closed when the E-Stop is released (normal operation):

- Contact Pair NC1: Short circuit between ESTOP_NC1_1 and ESTOP_NC1_2
- Contact Pair NC2: Short circuit between ESTOP_NC2_1 and ESTOP_NC2_2

Both contact pairs are open when the E-Stop is engaged (stop operation):

- Contact Pair NC1: Open circuit between ESTOP_NC1_1 and ESTOP_NC1_2
- Contact Pair NC2: Open circuit between ESTOP_NC2_1 and ESTOP_NC2_2

7.3 Key Switch Configuration

The Key Switch consists of two contact sets (1, 2).

The specific contact sets available on the E-Stop and Key Switch Interface are dependent on the Touchpad variant:

- Pivot: Contact Set 1
- Mounting Arm: Contact Set 1, Contact Set 2

Each contact set consists of three terminals:

- Contact Set 1: Common, Normally Open (NO), Normally Closed (NC)
- Contact Set 2: Common, Normally Open (NO), Normally Closed (NC)

The Common and NC terminals of both contact sets are normally connected when the Key Switch is set to the OFF position:

- Contact Set 1: Short circuit between Common and NC
- Contact Set 2: Short circuit between Common and NC

The Common and NO terminals of both contact sets are normally connected when the Key Switch is set to the ON position:

- Contact Set 1: Short circuit between Common and NO
- Contact Set 2: Short circuit between Common and NO

8 Installation Checklist for the Touchpad

8.1 Introduction

This chapter contains a checklist for the end user to implement and refer to before powering up the Touchpad.

8.2 Installation Checklist

	The installation location satisfies the requirements in section *4 Mechanical Installation*
	The supply voltage is within the operating limits of the Touchpad: +20.4Vdc to +28.8Vdc
	The wiring is connected to the appropriate terminals and the conductors are secured
	The appropriate power supply fuses have been installed
	All wiring conforms to applicable regulations and standards
	No physical damage is present to any component within the system
	All equipment connected to the Touchpad is ready for start-up
	A risk assessment meeting the required safety standard has been completed on the entire Machine

Table 28 Installation Checklist

9 Commissioning and Testing

9.1 Testing/Power-on Checks

The following procedure must be adhered to during start up to ensure safe operation and functionality:

1. Ensure all wiring is secure and there are no short circuits at the user installed connectors.
2. Plug in all connectors as described in section *5 Electrical Installation.*
3. All equipment connected to the Touchpad is ready for start-up.
4. The Touchpad E-Stop Switch is engaged.
5. The Touchpad Key Switch is set to OFF.
6. Ambient temperature is within 0 to +40C.
7. A Machine risk assessment has been performed and the Machine has been assessed as safe to use.
8. Ensure the external +24V Power Supply input is within the range +20.4Vdc to +28.8Vdc.

9.2 Commissioning Checks

The following procedure should be followed to commission the Touchpad:

1. Check the default Touchpad status:
   a. E-Stop engaged
   b. Key Switch set to OFF
2. Check the default Machine status:
   a. Ensure the Operating Door is Closed
3. Turn on the Power Source for the external +24Vdc Power Supply for the System (and the Touchpad)
4. Turn the System ON by momentarily depressing and releasing the ‘CTRL ON’ Switch:
   a. Check that the ‘CTRL ON’ Switch LED is now ON
   b. Check that the Host CNC enters the ON state and commences its Boot Up sequence
5. Check the operation of the Video Interface:
   a. Check that the Touchpad Display shows the following image sequence:
      i. Boot Up Screen
      ii. Operating System Home Screen
      iii. CNC Application Screen
   b. Wait for completion of the Machine initialisation sequence
6. Check the operation of the Audio Interface:
   a. Check that the default Host CNC Audio Output source is set to USB AUDIO CODEC
   b. Set the Host CNC Audio Output Level to 50%
   c. Confirm that the default Operating System Event Tones are audible

7. Check the operation of the USB Interface:
    a. Confirm the correct operation of the three External USB Ports:
        i. Insert a USB Disk Drive into each External USB Port and confirm Host CNC recognition
    b. Check that the Display Multi-point Touchpad Interface is operational
8. Release the E-Stop and check the operation of the following Switches and their LED Indicators through appropriate System functions or sequences:
    a. DOOR OPEN
    b. CYCLE START
    c. SPINDLE START
    d. SPINDLE STOP
9. Check the operation of the ‘CTRL ON’ Latch function (if configured):
    a. Momentarily depress and release the ‘CTRL ON’ Switch
    b. Confirm the ‘CTRL ON’ Switch LED remains ON
    c. Confirm that the Host CNC remains in the ON state
10. Check the operation of the E-Stop:
    a. Initiate a suitable System function or sequence which responds to the operation of the E-Stop
    b. Engage the E-Stop:
        i. Confirm that the System responds correctly to the operation of the E-Stop
        ii. For the Pivot Variant, confirm that the position of the Touchpad is effectively maintained by the pivot mechanism
    c. Release the E-Stop
    d. Re-initiate a suitable System function or sequence which responds to the operation of the E-Stop and confirm it is successfully executed
11. Check the operation of the Key Switch:
    a. Ensure the Machine is in an Idle Mode
    b. Set the Key Switch to ON
    c. Confirm that the Display/Machine indicates recognition of Key Switch ON state
    d. Set the Key Switch to OFF
    e. Confirm that the Display/Machine indicates recognition of Key Switch OFF state
12. For the Pivot Variant:
    a. Confirm the Rear Bump Stop prevents the Touchpad touching the Machine Chassis when the Touchpad is in the fully recessed position
    b. Confirm that the Touchpad rotates freely with a degree of resistance about a vertical axis defined by the Upper and Lower Pivot components
13. For the Mounting Arm Variant:
    a. Confirm correct operation of the Remote Pendant (if fitted)
    b. Confirm that the Touchpad and the attached Mounting Arm interface move freely

10 Operation

10.1 Display Interface

The Display Interface consists of a 19-inch Display and a multi-point Touchpad Interface.

The Display has a nominal resolution of 1024 x 1280 (H x V) in Portrait Mode (refer to the latest PMK User Manual for the Display configuration).

The brightness of the Display is fixed at 100% and is not adjustable by the customer.

The Display uses a Digital Video Interface connection.

The multi-point Touchpad Interface can be used in parallel with another Pointing device such as an External Mouse.

Surface scratches, dirt or grease can lead to compromised operation of the multi-point Touchpad Interface. The user should ensure that the interface is treated appropriately with only the use of a hand (with clean fingers) or a stylus.

10.2 External USB Interface

Three External USB Ports with a Type-A Connector are provided on the Touchpad.

Each Port is Bus Powered with a maximum current limit of 500 mA.

Typical devices that can be used on the External USB Ports include an External Mouse, External Keyboard, External Hard Disk Drive, and a USB Disk Drive.

Each External USB Port is fitted with a Protection Cap which should be closed over the Port when it is not in use to avoid the ingress of foreign substances.

When an overcurrent condition occurs on an External USB Port, the Operating System will display a notification flag and icon in the Notification Area of the Taskbar. The error can be cleared by double clicking the USB icon in the notification tray and following the prompts.

10.3 Audio Interface

The volume and mute status of the Audio Interface signal can be adjusted using the Windows Sound Level control, in addition to the Windows Sound Mixer and individual Application Volume controls.

10.4 Switch Interface

A total of five momentary action Tactile Switches (SW1, SW2, SW3, SW4, SW5) are used to control specific System functions.

Four momentary action Tactile Switches are provided with a non-latching function:

- DOOR OPEN (SW2)
- CYCLE START (SW3)
- SPINDLE STOP (SW4)
- SPINDLE START (SW5)

One momentary action Tactile Switch is provided with a latching function:

- CTRL ON (SW1)

The Front Panel layout of the five momentary action Tactile Switches is as follows:

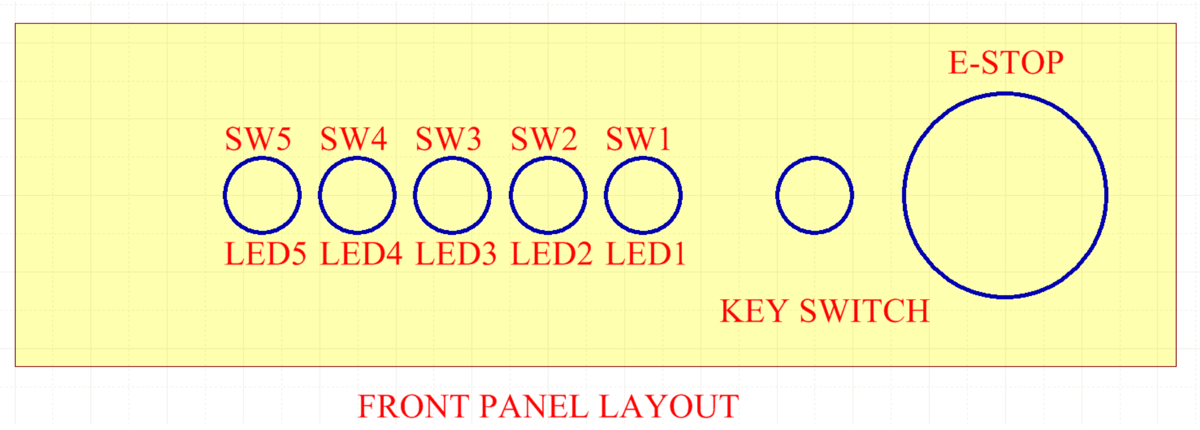


Figure 10-1 Front Panel Switch Layout

Each Tactile Switch includes an associated LED Indicator which is illuminated when +24Vdc is applied to the associated LED Drive Signal:

- SW1: LED1
- SW2: LED2
- SW3: LED3
- SW4: LED4
- SW5: LED5

When the DOOR OPEN (SW2), CYCLE START (SW3), SPINDLE STOP (SW4) or SPINDLE START (SW5) Tactile Switches are depressed, +24Vdc is provided on the associated Output Contact.

When the DOOR OPEN (SW2), CYCLE START (SW3), SPINDLE STOP (SW4) or SPINDLE START (SW5) Tactile Switches are **not** depressed, an Open Circuit is provided on the associated Output Contact.

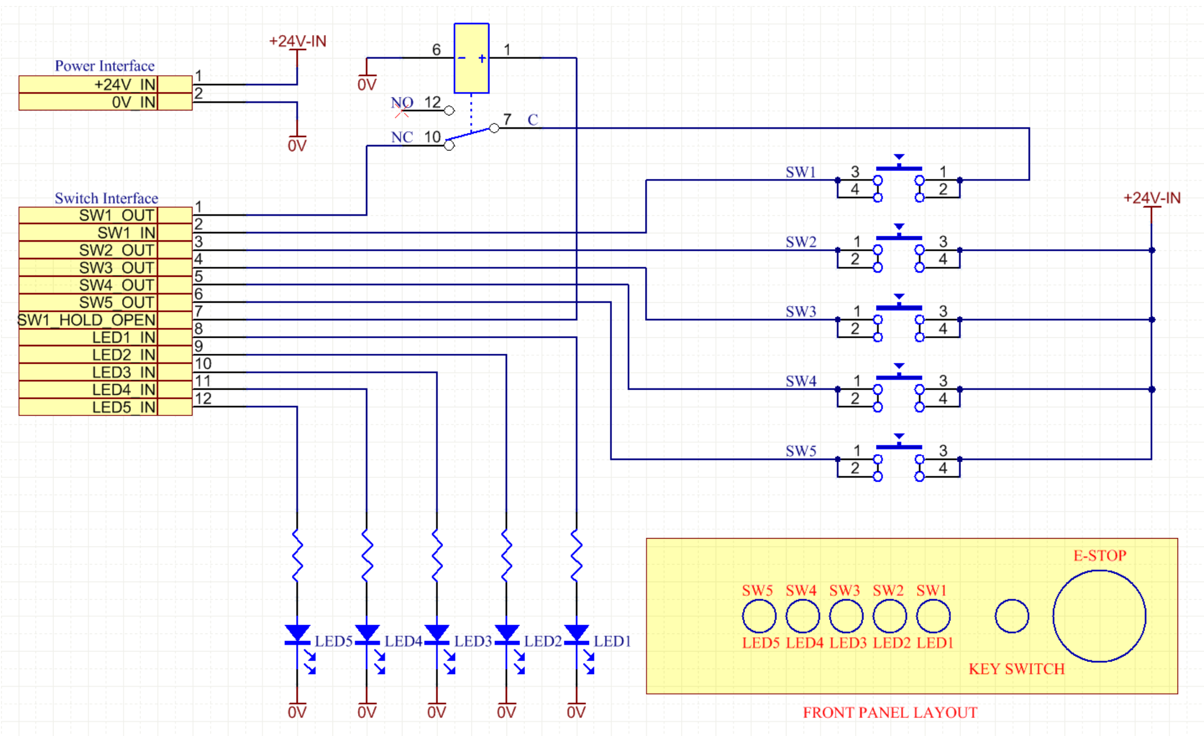


Figure 10-2 Touchpad Switch Interface Wiring Diagram

The contacts of the CTRL ON (SW1) Tactile Switch form a loop accessed via Connector X2 Pin 1 (SW1_OUT) and Connector X2 Pin 2 (SW1_IN). This loop is **only** designed to interface to the Power On subsystem of the associated AMC5 CNC (ATX Mode).

A separate Hold Function is provided for the CTRL ON (SW1) switch via a contact set of a Hold Relay.

The Hold Relay is controlled by the SW1_HOLD_OPEN (Connector X2: Pin 7) signal.

When the SW1_HOLD_OPEN signal is connected to 0 Vdc (or NC), the Hold Relay is OFF, the CTRL ON Tactile Switch contact loop is closed (Connector X2 Pin 1 connects to Connector X2 Pin 2), and the CTRL_ON Switch operation is active.

When the SW1_HOLD_OPEN signal is connected to +24 Vdc, the Hold Relay is ON, the CTRL ON Tactile Switch contact loop is held open (Connector X2 Pin 1 does not connect to Connector X2 Pin 2), and the CTRL_ON Switch operation is inhibited.

SW1_HOLD_OPEN State	SW1 Contact Loop State	CTRL ON Switch Operation
+24 Vdc	Hold ON: Loop Open	Inhibited
0 Vdc	Hold OFF: Loop Closed	Active

Table 29 CTRL ON (SW1) Latching Function

SW#	Switch Designation	Function	Output Contact	LED Designation	LED Input Signal
1	CTRL ON	Control On	X2/1 and X2/2	LED1	X2/8
2	DOOR OPEN	Door Open	X2/3	LED2	X2/9
3	CYCLE START	Cycle Start	X2/4	LED3	X2/10
4	SPINDLE STOP	Spindle Stop	X2/5	LED4	X2/11
5	SPINDLE START	Spindle Start	X2/6	LED5	X2/12

Table 30 Tactile Switch and LED Allocation

10.5 E-Stop and Key Switch Interface

10.5.1 E-Stop

The E-Stop Switch is engaged by depressing the Red Button and released (reset) by rotating the Red Button clockwise.

10.5.2 Key Switch

The Key Switch is used to control specific System Functions which are enabled when the Key Switch is in the ON position.

11 Touchpad Fault Diagnostics

11.1 Introduction

This chapter contains information that will guide the user in trouble shooting AMI5000 Touchpad diagnostic errors:

- Touchpad PCBA LED Indicator States
- Touchpad Display

11.2 Touchpad Board LED Indicator States

As shown in *Figure 11-1*, twelve diagnostic LED indicators are located on the Touchpad PCBA. These LED's can only be visually checked with the Rear Panel removed from the Touchpad. This diagnostic activity can only be undertaken by a trained professional. The LED state is detailed in the following tables:

- Table 31: Power Supply Indicator
- Table 32: USB Port Indicator: Host
- Table 33: USB Port Indicator: Green
- Table 34: USB Port Indicator: Amber
- Table 35: Audio Indicator

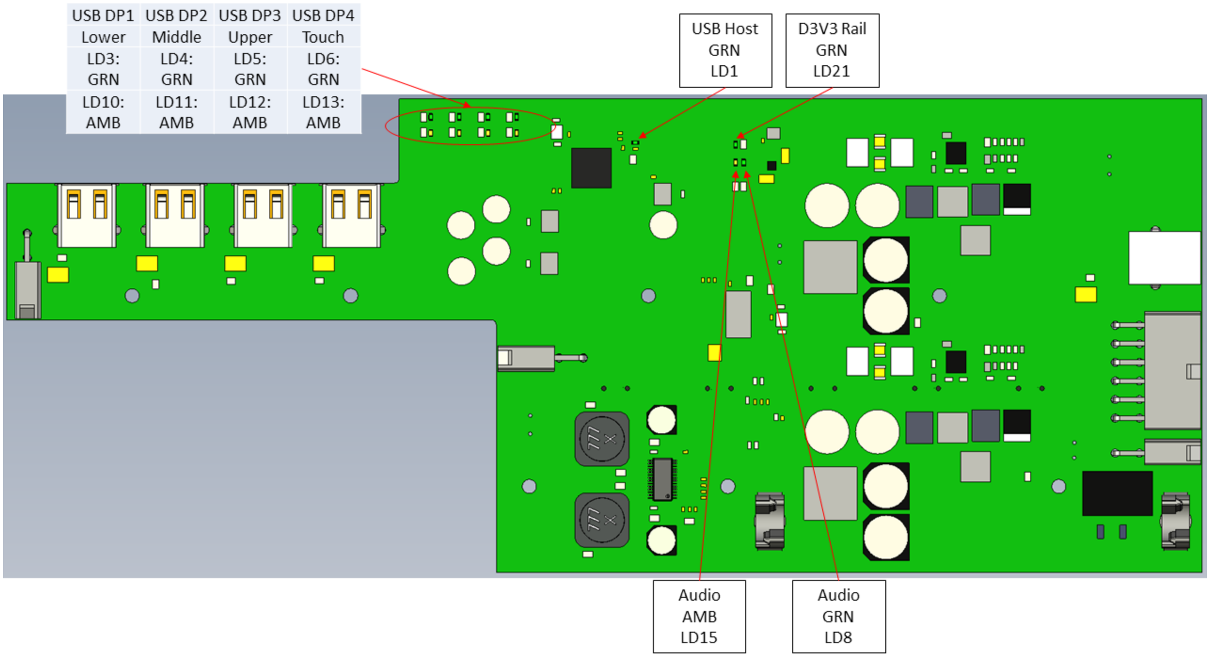


Figure 11-1 Touchpad Board Diagnostic LED Indicators

11.2.1 Power Supply Indicator

The D3V3 Rail is normally active when the AMI5000 Touchpad is in a powered state, as indicated by LED LD21. The +24 Vdc Power Supply and its connection to the Touchpad PCBA via Connector X1 should be checked if LED LD21 is OFF.

LED (Green)	LED State	Description	Default	Note
LD21	ON	D3V3 Supply Active	Default	
	OFF	D3V3 Supply Inactive	N/A	Check +24 Vdc Power Supply Connection

Table 31 Power Supply LED Indicator States

11.2.2 USB Port Indicators

The Upstream USB Port connection to the Host CNC is normally set to a High-Speed Mode (<= 480 Mbps) when the AMI5000 Touchpad is in a powered state, as indicated by LED LD1. The Host CNC configuration and its connection to the Touchpad PCBA via Connector X3 should be checked if LED LD1 is OFF, indicating a Full Speed Mode connection (<= 12 Mbps) or no connection.

LED (Green)	Description	Allocation	LED State	Default	Note
LD1	Upstream Port: High Speed	Host	ON	Default	Host Port: High Speed (<= 480 Mbps)
			OFF	N/A	Host Port: Full Speed (<= 12 Mbps)

Table 32 Host USB Port Status LED Indicator States

There is a total of five Downstream USB Port connections with the following allocation:

- External USB Ports: Total of three (Upper, Middle, Lower)
- Internal Touchpad Interface: One
- Internal Audio Interface: One (refer to section *11.2.3 Audio LED Indicators*)

Each Downstream USB Port is provided with two LED State indicators:

- Green Status LED
- Amber Status LED

USB Devices connected to an External USB Port (Upper, Middle or Lower) are normally enumerated and in an Operational - No Error mode when the AMI5000 Touchpad is in a powered state, as indicated by the associated Green (ON) and Amber (OFF) LED states.

The connection of the USB Device to the External USB Port should be checked if the Green LED is OFF or Amber LED is ON, indicating a configuration or connection issue. The interconnecting USB Cable from the Touchpad PCBA to the rear of the specific External USB Port should also be checked if required. The configuration of the USB Hub Controller on the Touchpad PCBA should also be checked via the Host CNC Device Manager. The USB Hub Controller can be reset via a Disable/Enable sequence through the Host CNC Device Manager.

When an overcurrent condition occurs on an External USB Port, the Operating System should display a notification flag and icon in the Notification Area of the Taskbar. The error can be cleared by double clicking the USB icon in the notification tray and following the prompts.

LED (Green)	Description	Allocation	LED State	Default	Note
LD3	Downstream Port 1 (DP1): Status	External USB Port: Lower	ON	N/A	Enumerated: Operational
			OFF	N/A	Not Enumerated
LD4	Downstream Port 2	External USB Port:	ON	N/A	Enumerated: Operational

LED (Green)	Description	Allocation	LED State	Default	Note
	(DP2): Status	Middle	OFF	N/A	Not Enumerated
LD5	Downstream Port 3 (DP3): Status	External USB Port: Upper	ON	N/A	Enumerated: Operational
			OFF	N/A	Not Enumerated
LD6	Downstream Port 4 (DP4): Status	Touchpad I/F	ON	Default	Enumerated: Operational
			OFF	N/A	Not Enumerated

Table 33 USB Port Status LED (Green) Indicator States

LED (Green)	Description	Allocation	LED State	Default	Note
LD10	Downstream Port 1 (DP1): Status	External USB Port: Lower	ON	N/A	Enumerated: Error
			OFF	Default	Enumerated: No Error
LD11	Downstream Port 2 (DP2): Status	External USB Port: Middle	ON	N/A	Enumerated: Error
			OFF	Default	Enumerated: No Error
LD12	Downstream Port 3 (DP3): Status	External USB Port: Upper	ON	N/A	Enumerated: Error
			OFF	Default	Enumerated: No Error
LD13	Downstream Port 4 (DP4): Status	Touchpad I/F	ON	N/A	Enumerated: Error
			OFF	Default	Enumerated: No Error

Table 34 USB Port Status LED (Amber) Indicator States

11.2.3 Audio LED Indicators

The Audio USB Interface from the Host CNC is normally enumerated and in an Operational - No Error mode when the AMI5000 Touchpad is in a powered state, as indicated by the Green LD8 (ON) and Amber LD15 (OFF) LED states.

The configuration of the USB Hub Controller on the Touchpad PCBA should be checked via the Host CNC Device Manager if the Green LED is OFF or the Amber LED is ON, indicating a configuration or connection issue. The USB Hub Controller can be reset via a Disable/Enable sequence through the Host CNC Device Manager.

LED	Description	LED State	Default	Note
LD8	USB Audio: Green LED: Status	ON	Default	Enumerated: Operational
		OFF	N/A	Not Enumerated
LD15	USB Audio: Amber LED: Status	ON	N/A	Enumerated: Error
		OFF	Default	Enumerated: No Error

Table 35 Audio Status LED Indicator States

11.3 Touchpad Display

The AMI5000 Touchpad incorporates a 19-inch Display with an integrated multi-point Touchpad Interface.

11.3.1 Display

The Display is connected to the Host CNC via a Digital Video interface connection (Host Display Port to Touchpad DVI-D) and is normally in an ON state when the AMI5000 Touchpad is in a powered state, as indicated by an active Display image.

The Digital Video interface connection is achieved by an active Display Port to HDMI Adaptor Cable from the Host CNC to the Touchpad Chassis, and then a passive HDMI to DVI-D Adaptor to the DVI-D connector on the rear of the Display.

The +24 Vdc Power Supply and its connection to the Touchpad PCBA via Connector X1 should be checked if there is no active Display image. Other items that should be checked include the state of the Host CNC (powered), the interconnecting Display D12V Power Cable from the Touchpad Board to the rear of the Display, and the Digital Video connection to the Touchpad via the DVI-D to HDMI Adaptor in the rear of the Unit.

The brightness of the Display is fixed at 100% and is not adjustable by the customer.

11.3.2 Multi-point Touchpad Interface

The Display Multi-Point Touchpad Interface is connected to the Host CNC via USB Downstream Port 4 (DP4) on the Touchpad PCBA. It is normally enumerated and in an Operational - No Error mode when the AMI5000 Touchpad is in a powered state, as indicated by the Green (ON) and Amber (OFF) LED states (refer to section *11.2.2 USB Port Indicators*).

The USB connection of the Display to the Touchpad PCBA should be checked if the Green LED (LD6) is OFF or the Amber LED (LD13) is ON, indicating a configuration or connection issue. The configuration of the USB Hub Controller on the Touchpad PCBA should also be checked via the Host CNC Device Manager. The USB Hub Controller can be reset via a Disable/Enable sequence through the Host CNC Device Manager.

The Touch Screen surface should be regularly cleaned to ensure the screen is free from any dirt or grease, thereby optimising the sensitivity of the multi-point touch interface. The screen can be cleaned using water and a lint free damp cloth.

11.3.3 Multi-point Touchpad Interface: Calibration Procedure

The Multi-point Touchpad Interface should be calibrated (as required) using the following procedure:

- Access the Calibrate Tool under the Control Panel > Tablet PC Settings selection
- Switch to the Display Tab of the Tablet PC Settings dialogue
- Select the Display as “ICN-3120-1041” and activate the Calibrate Task
- Follow the on-screen instructions to calibrate the Touchscreen, which will involve position confirmation of multiple points across the face of the display, and the saving of the calibration data

12 Standards Conformity

12.1 CE Compliance

A CE mark is attached to the Product Label in order to verify that the unit meets the relevant Environmental and Electromagnetic Compliance (EMC) directives of the European Union.

財團法人精密機械研究發展中心
Precision Machinery Research & Development Center
No.27, 37th Road, Taichung Industrial Park, Taichung, Taiwan, R.O.C.

TEL: 886-4-2359-9009
FAX: 886-4-2359-8847
www.pmc.org.tw

CE EMC TEST REPORT

Applicant	:	ANCA Motion Pty. Ltd. 1 Bessemer Road, Bayswater North, Melbourne, Victoria, 3153, Australia
Manufacturer	:	ANCA Motion Taiwan Co., Ltd. 1F, No.57, 37 Rd., Taichung Industrial Park Taichung 407 Taiwan
Product Name	:	AMI5000 Touchpad
Model	:	646-0-02-1100
Series Model	:	N/A
Accessory	:	MW/SP-150-24 (output: DC24V, 6.3A), Input: AC100-240V, 50Hz/60Hz ANCA Motion/AMC5 CNC Control Unit, Input: DC24V, 3A
Power Source	:	DC 24V, 3.0A
Test Date	:	2015/11/11 and 2015/11/12
Standards	:	EN 61000-6-2:2005 EN 61000-6-4:2007 (EN 55011:2009/A1:2010)
Test Result	:	PASS
Test Laboratory	:	PMC Electromagnetic Compatibility Testing Laboratory No.27, 37th Road, Taichung Industrial Park, Taichung, Taiwan, R.O.C. TEL: +886-4-2359-9009 FAX:+886-4-2359-8847

Tested by	**Yu Chi Chou**	Signature	December 08, 2015 Date
Approved by	**Tim Hise**	Signature	December 08, 2015 Date

Note:
1. The test results only responds to the tested sample, and is invalid as separately used.
2. The test results are invalid without examination stamp and signature of this laboratory.
3. The test results are not reproduced except in full without the written approved of PMC Lab.

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12.2 FCC Marking

A FCC mark is attached to the Product Label in order to verify that the unit meets the relevant Electromagnetic Compliance (EMC) standards of the Federal Communications Commission.

PMC 財團法人精密機械研究發展中心
Precision Machinery Research & Development Center
No.27, 37th Road, Taichung Industrial Park, Taichung, Taiwan, R.O.C.

TEL: 886-4-2359-9009
FAX: 886-4-2359-8847
www.pmc.org.tw

EMC TEST REPORT

Applicant	:	ANCA Motion Pty. Ltd. 1 Bessemer Road, Bayswater North, Melbourne, Victoria 3153 Australia
Manufacturer	:	ANCA Motion Taiwan Co., Ltd. 1F, No.57, 37 Rd., Taichung Industrial Park Taichung 407 Taiwan
Product Name	:	AMI5000 Touchpad
Model Name	:	646-1-00-1200
Series Model	:	See the Section 1.4
Accessory	:	MW/SP-150-24 (output:DC24V,6.3A), Input: AC100-240V,50Hz/60Hz ANCA Motion/AMC5 CNC Control Unit, Input: DC24V, 3A ANCA Motion/AMI5000 Remote Pendant, Input: DC24V, 1A
Power Source	:	DC 24V, 3A
Test Standards	:	FCC CFR Title 47 Part 15 Subpart B: 2005 Class A
Test Date	:	2017/02/18
Test Result	:	**PASS**
Test Laboratory	:	PMC Electromagnetic Compatibility Testing Laboratory No.27, 37th Road, Taichung Industrial Park, Taichung, Taiwan, R.O.C. TEL: +886-4-2359-9009 FAX:+886-4-2359-8847

Tested by	**Yu Chi Chou**	Signature	Mar., 07, 2017 Date
Approved by	**Tim Hise**	Signature	Mar., 07, 2017 Date

Note：
The test results only responds to the tested sample, and is invalid as separately used.
The test results are invalid without examination stamp and signature of this laboratory.
The test results are not reproduced except in full without the written approved of PMC Lab.

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13 Specifications

13.1 Electrical

Attribute	Qualification
13.1.1 Power Supply	
Supply Voltage	+24Vdc -15/+20%
Supply Current	Nominal: 2A, Maximum: 3A
Protection	Input Transient and Reverse Polarity
Power Supply Interface Connector	Manufacturer: Molex, Series: Mini Fit Jr, Type: Header, Pins: 2 Molex Part Number: 39-30-1021
13.1.2 Switch Interface	
Tactile Switch Activate Force	1.8N (nominal)
Tactile Switch Travel Distance	Total Travel Distance: 0.35mm (nominal)
Tactile Switch Contacts	NO Momentary
Tactile Switch Contact Rating	Switch: Control ON: 3.3Vdc at 2mA Switch: Door Open, Cycle Start, Spindle Stop, Spindle Start: 24Vdc at 50mA
Tactile Switch: Protection: Control ON	Nominal Current: 2mA Overload Current: 30mA
Tactile Switch: Protection: Door Open, Cycle Start, Spindle Stop, Spindle Start	Nominal Current: 50mA Overload Current: 200mA
Switch: Control ON	Function: Control ON Switch Function: Closed momentary - then remain open until power off Latching Function provided by Relay SPDT NC Contact, Drive Signal: +24Vdc at 10mA Colour: Green outline Label: CTRL ON
Switch: Door Open	Function: Door Open Switch Function: NO Momentary Colour: White Label: DOOR OPEN
Switch: Cycle Start	Function: Cycle Start Switch Function: NO Momentary Colour: Green Label: CYCLE START
Switch: Spindle Stop	Function: SPINDLE STOP Switch Function: NO Momentary Colour: Red Label: SPINDLE STOP
Switch: Spindle Start	Function: SPINDLE START Switch Function: NO Momentary Colour: White Label: SPINDLE START
Tactile Switch: LED: Colour	Red
Tactile Switch: LED: Drive Control	Drive Signal: +24Vdc (High): LED ON (Drive Current: 5mA) Drive Signal: 0Vdc (Low): LED OFF
Switch Interface Connector	Manufacturer: Molex, Series: Mini Fit Jr, Type: Header, Pins: 12

	Molex Part Number: 39-30-1121

13.1.3 E-Stop and Key Switch Interface

E-Stop: Contacts	COM + NC (SPST) - 2 wires x 2 pairs (4 wire)
Key Switch: Contacts	Contact Set 1: COM + NC + NO (SPDT) Contact Set 2: COM + NC + NO (SPDT)
Key Switch: Active Contact Sets	Pivot Variant: Contact Set 1 Mounting Arm Variant: Contact Set 1 and Set 2
Key Switch: Labels	SETUP: ON: COM connects to NO SETUP: OFF: COM connects to NC
E-Stop and Key Switch Interface Connector: Pivot Variant	Manufacturer: Molex, Series: Mini Fit Jr, Type: Receptacle, Pins: 8 Molex Part Number: 39-01-2080
E-Stop and Key Switch Interface Connector: Mounting Arm Variant	Manufacturer: Molex, Series: Mini Fit Jr, Type: Receptacle, Pins: 10 Molex Part Number: 39-01-2100

13.1.4 Audio Interface

Audio: Source	Digital Signal Source: USB CODEC
Audio: Volume Control	Provided by Host Application
Audio: Output Signal	Monophonic
Audio: Output Power Level	Nominal: 2W, Maximum: 3W

13.1.5 Video Interface

Display Type	LCD TFT with Active Matrix
Screen Size	19-inch Diagonal
Active Area	377 x 302mm (Horizontal x Vertical)
Aspect Ratio	5:4
Contrast Ratio	1000:1
Vertical Viewing Angle[1]	80deg
Horizontal Viewing Angle[1]	85deg
Central Luminance	250cd/m^2
Video Interface Type	Digital
Video Resolution	Minimum: 1280 x 1024 (W x H referenced to Landscape Mode)
Colour Depth	24 bit
Refresh Rate	60 to 75Hz
Video Interface Connector	DVI-D: Single Link: Female
Bright sub-pixel defects[2]	1 maximum
Dark sub-pixel defects[3]	2 maximum
Total combined bright and dark sub-pixel defects	2 maximum
Full Pixel Defects pixel defects:[4]	0 allowed

[1] This was measured with 180deg angle and split into two sets of 90deg for each direction in the axis of measurement. This value is from the centre outwards, tangent to the screen face being 0deg.
[2] Bright spot on a black background is caused by sub-pixels (in this case, a red sub-pixel) in the "on" state
[3] Dark spot on a white background results from a green sub-pixel, which is in the "off" or dark state
[4] Bright white dot or very noticeable black dot on the display

13.1.6 Touch Interface

Touch Interface: Type	Capacitive
Touch Interface: Area	Entire Active Display area
Touch Interface: Surface	Glass
Touch Interface: Multi-Touch	Support for >= two touch points

13.1.7 USB Interface

Number of External Ports	External: Three Ports
USB Hub Type	Powered
Power Source	Internal Power Source
External Connector (Receptacle)	Type A
Number of Host Ports	One
Physical Standard	USB 2.0 (Hi-Speed)
Line Rate	480Mbps
USB Interface Connector: Host (Receptacle)	Type B

13.2 Mechanical

13.2.1 Physical

Dimensions: Overall: Pivot Variant	Width: 390mm (Main Chassis width only) Depth: 65mm (Rear Panel to the Front Panel) Height: 540mm (Main Chassis height only) Width: 395mm (USB cover to the Main Chassis) Depth: 112mm (Rear Panel bump stop to the Key Switch) Height: 547mm (Lower Pivot Plate to the top of the Main Chassis)
Dimensions: Overall: Mounting Arm Variant	Width: 390mm (Main Chassis width only) Depth: 67mm (Rear Panel to the Front Panel) Height: 540mm (Main Chassis height only) Width: 395mm (USB cover to the Main Chassis) Depth: 97mm (Rear Panel to the Key Switch)
Material	Steel
Weight	Pivot Variant: 11.5kg Mounting Arm Variant: 13.5kg
Mounting: Method	Pivot Variant: Integral Pivot with External Fixings (Top and Bottom) Mounting Arm Variant: Rolec profiPLUS 50 Mounting Arm
Mounting: Orientation	Vertical
Protection Rating: Electrical Circuits	IP22 when fully assembled IP53 when incorporated within the Main Chassis
Protection Rating: Overall	IP53

13.2.2 Environmental	
Ambient Temperature: Operating	0 to +40C
Relative Humidity: Operating	5 to 85% non-condensing
Ambient Temperature: Storage	-25 to +55C
Relative Humidity: Storage	5 to 95%
Dust and Solid Particles	Clean air, Pollution degree 2 (IEC 60664-1)
Vibration	Class 3M1

13.3 AMI5000 Touchpad Overall Dimensions

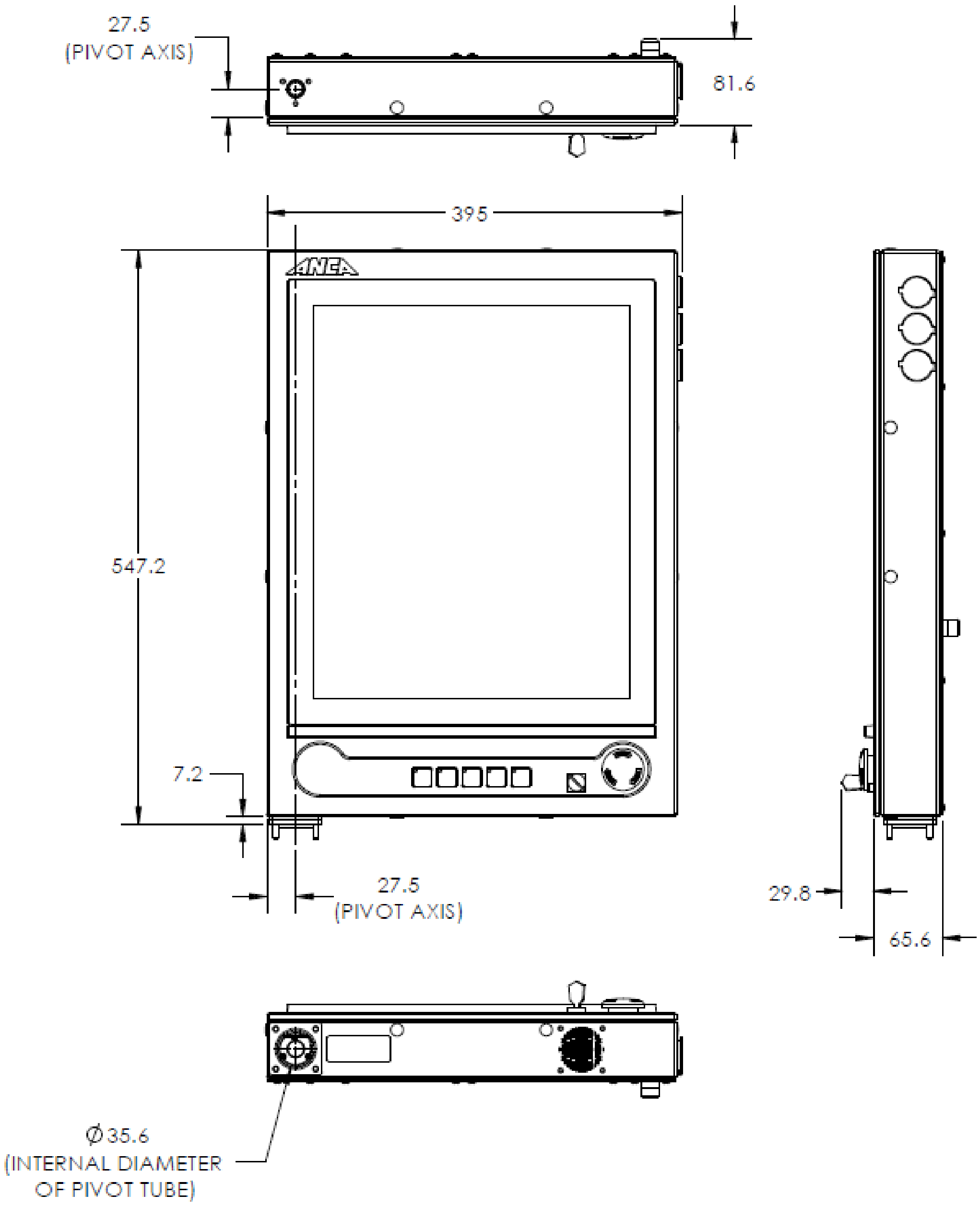


Figure 13-1 Touchpad Overall Dimensions

13.4 Fitment Dimensions for Typical Machine: Pivot Variant

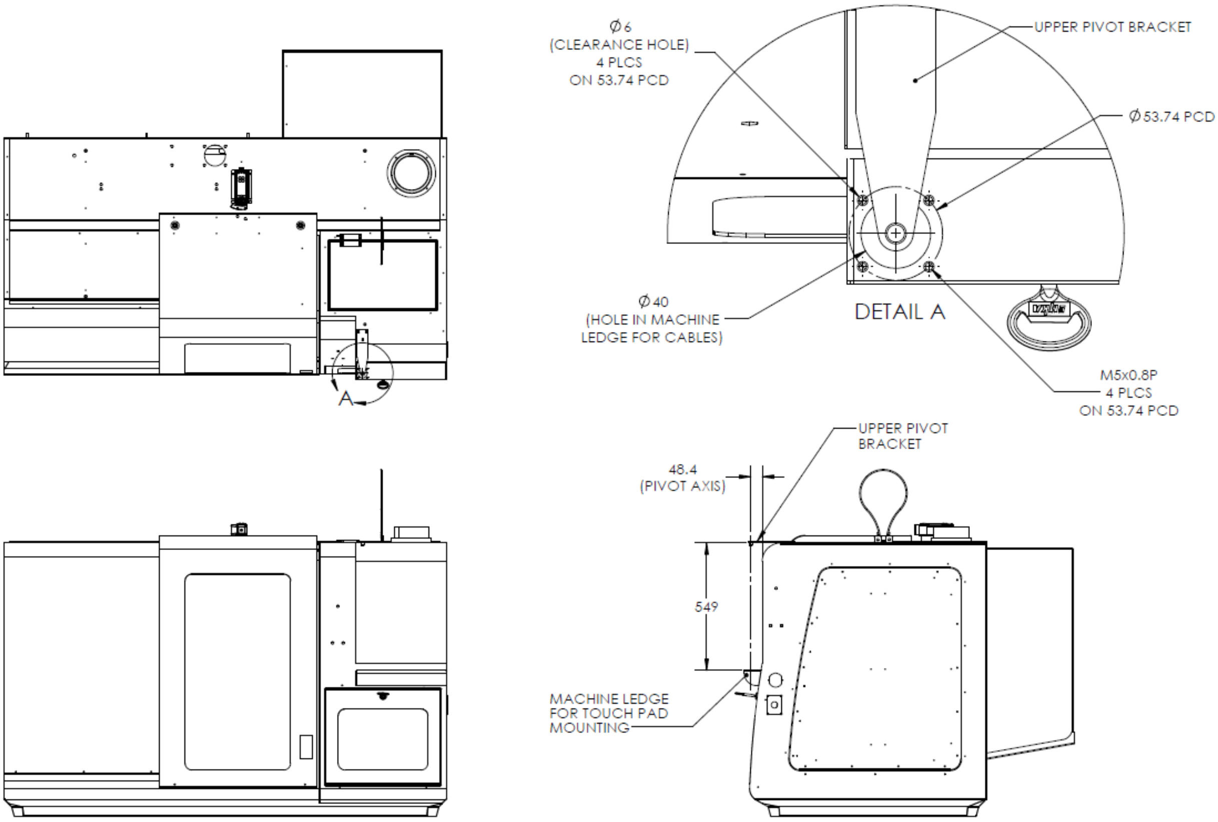


Figure 13-2 Fitment Dimensions for Typical Machine: Pivot Variant

13.5 Upper Pivot Bracket Dimensions: Pivot Variant

Figure 13-3 Upper Pivot Bracket Dimensions: Pivot Variant

13.6 Lower Pivot Mounting Details: Pivot Variant

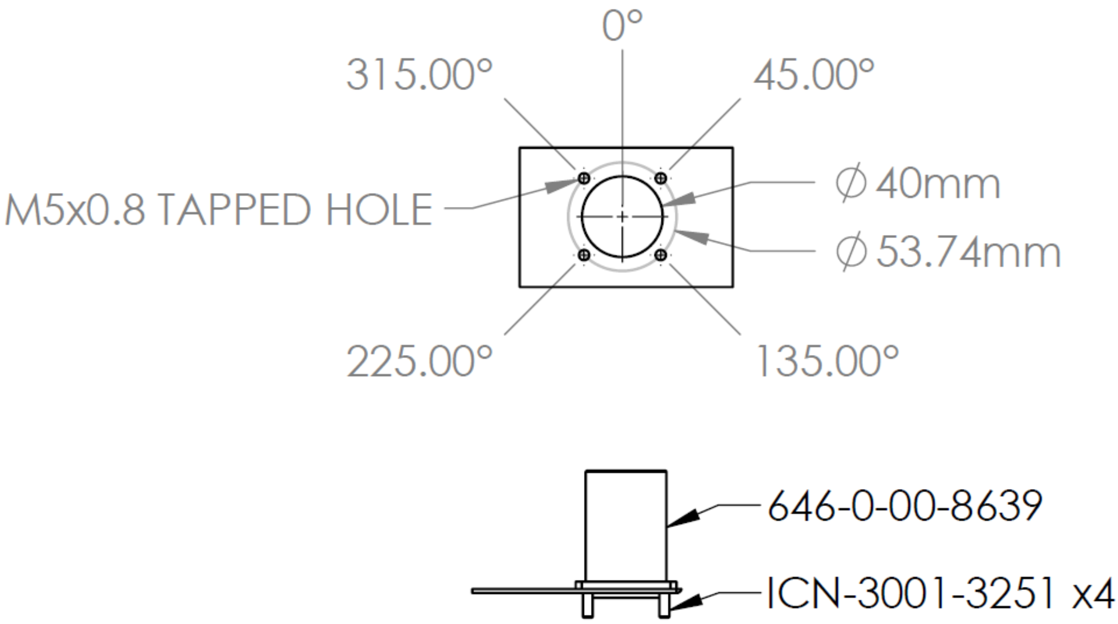


Figure 13-4 Lower Pivot Mounting Details: Pivot Variant

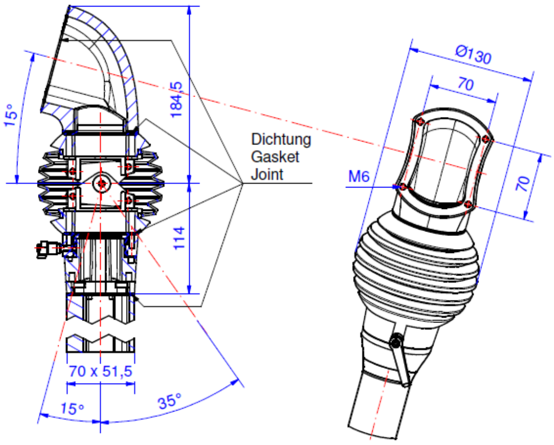
The Lower Mounting surface has a central access hole diameter of 40 mm for cable ingress and four tapped holes (M5x0.8) for the Mounting Bolts (ICN-3001-3251). The Lower Pivot Clamp Plate Assy (646-0-00-8639) has four clearance holes each of diameter 6 mm. Four M5 Mounting Bolts (Socket Head Cap Screw Low Head M5x16mm, ICN-3001-3251) are used to secure the Lower Pivot Clamp Plate Assy to the Lower Mounting surface.

13.7 Rolec Mounting Arm Specifications: Mounting Arm Variant

Figure 13-5 profiPLUS 50 Mounting Arm from Rolec 142.280.XXX (XXX = Cut Length)

ROLEC.de

Tragarm-System	profiPLUS 50
Type:	Pultkupplung N, stehend
Artikel-Nr.:	142.280.250 (l= 250mm) 142.280.500 (l= 500mm) 142.280.750 (l= 750mm) 142.281.000 (l=1000mm)



Material Systemelemente	GD-Al Si 12 (DIN 1706)	Schwenkbereich	310°
Material Tragprofil	Aluminium Strangpressprofil	Gewicht	2.490 g + Tragprofil 3.600 g/m
Dichtung	4x Zellkautschuk (CR), schwarz	Beschichtung	Pulverlackierung RAL 7035, lichtgrau
Montageschrauben	4x M6, Stahl verzinkt	Oberfläche Tragprofil	Silber eloxiert
Schutzart	IP54 EN 60529	Toleranz	Außenmaße ±0,8mm, Restmaße nach GTA 13/5 DIN 1688-4

Figure 13-6 profiPLUS 50 Mounting Arm Design Specification

The Touchpad Rear Panel has a central access port for routing the cables into the Touchpad from the Machine electrical cabinet and distribution panel.

14 Accessories

14.1 Introduction

This chapter contains summarized information on accessories available for the AMI5000 Touchpad.

14.2 Recommended Power Interface Connector

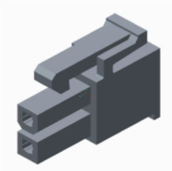
Manufacturer	Part Number	Description	Image
Molex	39-01-2020 (ICN-3077-1786)	Molex Mini-Fit Jr. Receptacle, Pins: 2	

Table 36 Power Interface Connector

14.3 Recommended Switch Interface Connector

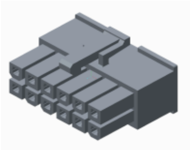
Manufacturer	Part Number	Description	Image
Molex	39-01-2120 (ICN-3077-1776)	Molex Mini-Fit Jr. Receptacle, Pins: 12	

Table 37 Switch Interface Connector

14.4 Recommended E-Stop and Key Switch Interface Connectors

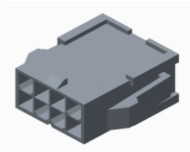
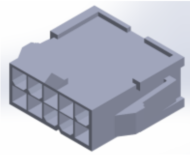
Manufacturer	Part Number	Touchpad Variant	Description	Image
Molex	39-01-2081 (ICN-3077-1773)	Pivot	Molex Mini-Fit Jr. Plug Housing, Pins: 8	
Molex	39-01-2101 (ICN-3077-1872)	Mounting Arm	Molex Mini-Fit Jr. Plug Housing, Pins: 10	

Table 38 E-Stop and Key Switch Interface Connectors

14.5 Recommended Connector Crimps

Manufacturer	Part Number	Description
Molex	39-00-0073 (ICN-3077-1717)	Molex Mini-Fit Jr. Female Crimp Pin
Molex	39-00-0075 (ICN-3077-1736)	Molex Mini-Fit Jr. Male Crimp Pin

Table 39 Connector Crimps

14.6 Cable Assemblies

Manufacturer	Part Number	Description
ANCA Motion	ICN-1026-1060	Cable Assembly: USB Type A to Type B, 5 m, Ferrites
ANCA Motion	ICN-1026-2139	Cable Assembly: Display Port-Male to HDMI-Male, 5 m

Table 40 Cable Assemblies

14.7 Adaptor Cable Assemblies

Manufacturer	Part Number	Description	Image
ANCA Motion	646-0-00-8717	Adaptor Cable Assembly AMI5000 Touchpad: Provide an interface from the AMI5000 Touchpad Pivot Variant (646-X-02-1100) to a Customer Machine cabled for a V1 Touchpad (646-0-00-1100)	
ANCA Motion	619-0-00-1517	Adaptor Cable Assembly AMI5000 Touchpad: Provide an interface from the AMI5000 Touchpad Mounting Arm Variant (646-X-00-1200) to a Customer Machine cabled for a V1 Touchpad (646-0-00-1100)	
ANCA Motion	619-0-00-1551	Adaptor Cable Assembly AMI5000 Touchpad: Provide an interface from the AMI5000 Touchpad Mounting Arm Variant (646-X-00-1200) to a Customer Machine cabled for a AMI5000 Touchpad Pivot Variant (646-X-02-1100)	

Table 41 Adaptor Cable Assembly

14.8 Demonstration Wiring Loom

The AMI5000 Touchpad Demonstration Wiring Looms provide an interface to the AMI5000 Touchpad for demonstration purposes.

Manufacturer	Part Number	Touchpad Variant	Description	Image
ANCA Motion	646-0-00-8736	Pivot	Demonstration Wiring Loom AMI5000 Touchpad V2, Length: 5 m	
ANCA Motion	646-0-00-8852	Pivot	Demonstration Wiring Loom AMI5000 Touchpad V2, Length: 10 m	
ANCA Motion	646-0-00-8867	Mounting Arm	Demonstration Wiring Loom AMI5000 Touchpad V3, Length: 5 m	
ANCA Motion	646-0-00-8890	Mounting Arm	Demonstration Wiring Loom AMI5000 Touchpad V3, Length: 10 m	

Table 42 Demonstration Wiring Loom

14.9 Mounting Arm Variant Accessories

Manufacturer	Part Number	Touchpad Variant	Description	Image
ANCA Motion	646-0-00-8893	Mounting Arm	Cradle Bracket	
ANCA Motion	646-0-00-8892	Mounting Arm	Keyboard Tray	
ANCA Motion	AMI5-C0401-DE00	Mounting Arm	Remote Pendant	
ANCA Motion	646-0-01-8367	Mounting Arm	Remote Pendant Cradle	

For the latest Remote Pendant information, please refer to the *Remote Pendant User Manual.*

15 Additional Information

15.1 Display Cleaning

The Touchpad LCD Touch Screen can be cleaned using warm water with a clean damp cloth.

15.2 Maintenance and Repairs

There are no user serviceable parts inside the AMI5000 Touchpad; therefore, maintenance only involves inspection of the Touchpad and its connections and the enclosure. Make sure that all connections are fitted correctly and that there are no signs of damage. Check that all wires are tightly fitted to the connectors and that there are no signs of discolouration which may indicate heating. Make sure the Touchpad Rear Cover is securely fitted and that there are no signs of damage. Make sure that the Touchpad enclosure is free from dust or anything that may inhibit its operation. Refer to section *4 Mechanical Installation* for site requirements, tools, and installation and uninstallation information.

There are no internal adjustments inside the AMI5000 Touchpad. For any repairs please contact our nearest office or agent. Refer to section *15.3 Product, Sales and Service Enquiries*
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15.3 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.

ANCA Motion Pty. Ltd.
1 Bessemer Road
Bayswater North
VIC 3153
AUSTRALIA
Telephone: +613 9751 8900
Fax: +613 9751 8901
www.ancamotion.com/Contact-Us
Email: sales.au@ancamotion.com

ANCA Motion Taiwan
4F, No. 63, Jingke Central Road,
Nantun District,
Taichung City 40852,
TAIWAN
Telephone: +886 4 2359 0082
Fax: +886 4 2359 0067
www.ancamotion.com/Contact-Us
Email: sales.tw@ancamotion.com

ANCA Motion (Tianjin) Co., Ltd.
No. 102, Building F1
XEDA Emerging Industrial Park
Xiqing Economic-technological Development Area
Tianjin, P.R.China
Telephone: +86 22 5965 3760
Fax: +86 22 5965 3761
www.ancamotion.cn/Contact-Us
Email: sales.cn@ancamotion.com

15.4 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: www.ancamotion.com/Contact-Us