



AMI5000 Series - EtherCAT Remote Pendant - User Manual

D-000065– Issue V12



AMI5000 Series - EtherCAT Remote Pendant - User Manual

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1. Safety

1.1 General Safety



Warning: The Remote Pendant contains 3 permanent magnets in the back of the case to hold the Pendant into the mounting cradle. People with pacemakers or similar medical implant devices should not hold the Pendant closer than 50mm (2 inches) to the chest.

This manual and the warnings attached to the Remote Pendant 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 Remote Pendant.
- 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 cover to access the inside of the Remote Pendant 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 Remote Pendant, which may cause malfunction or failure.
- Keep the vicinity of the Remote Pendant clean and tidy.
- Never attempt cleaning or inspection during machine operation.
- 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 Remote Pendant. 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 Remote Pendant 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 Remote Pendant

The AMI5000 Remote Pendant is used as a Human Machine Interface (HMI). It uses EtherCAT® communications technologies to interface with the EtherCAT control system, allowing fast and flexible access for real-time control.

Please note that the Remote Pendant is available in Standard or Lite configuration. Along with the Pendant Lite features, the Pendant Standard version includes the following additional features:

- Hold-To-Run switch
- Warning Buzzer

The Pendant requires two supporting products:

- Pendant Patch Board (Part No. 646-0-00-8874)
- Pendant Cradle (Part No. 646-0-01-8367)

as shown in [Figure 2-1](#).

These products need to be ordered separately.

The Remote Pendant cable connects to the Pendant Patch Board which acts as a bridge between the Control System and the Remote Pendant.

As the Pendant is a handheld device, a Cradle can be mounted on the end user equipment for easy storage of the Pendant.

Please refer to [3.2 Features](#) for more details of features available.



Figure 2-1 Remote Pendant Standard, Remote Pendant Lite and supporting products

2.3 Terms and Abbreviations

EMC	Electromagnetic Compatibility
I/O	Input / Output
N/A	Not Applicable
GND	Ground
AC / DC	Alternating Current / Direct Current
CNC	Computer Numerical Control
OPB	Output Physical Boolean
IPB	Input Physical Boolean
IPI	Input Physical Integer
N/C	Pin is not connected
PD2	Pollution Degree 2

Table 1 Terms and Abbreviations

2.4 Trademarks

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

3. Product Overview

3.1 Introduction

This chapter introduces reader to the Remote Pendant by providing the following information

- Features,
- Label and Marking configuration
- Product Overview and Dimensions

3.2 Features

The ANCA Motion AMI5000 Remote Pendant has the following features:

- Compact, and ergonomic design
- 16 tactile switches with LED indicators.
- Manual Pulse Generator (MPG).
- Feedrate Control
- Dual channel Emergency Stop button.
- EtherCAT® connectivity.
- Firmware Upgradeable.
- Dual channel Hold-To-Run switch. (Pendant Standard only)
- Warning Buzzer (Pendant Standard only)

3.3 AMI5000 Remote Pendant Product Label Explanation

The Remote Pendants are marked with an identification label. The label configuration is shown below.

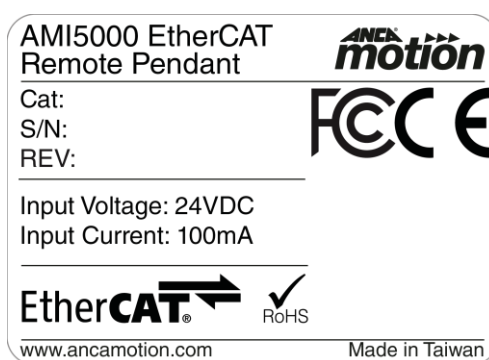


Figure 3-1 Remote Pendant Label



For any warranty work to be undertaken these labels 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 back of the product.

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

3.4 AMI5000 Remote Pendant Catalogue Number Interpretation

The Remote Pendant catalogue number interpretation is shown below.

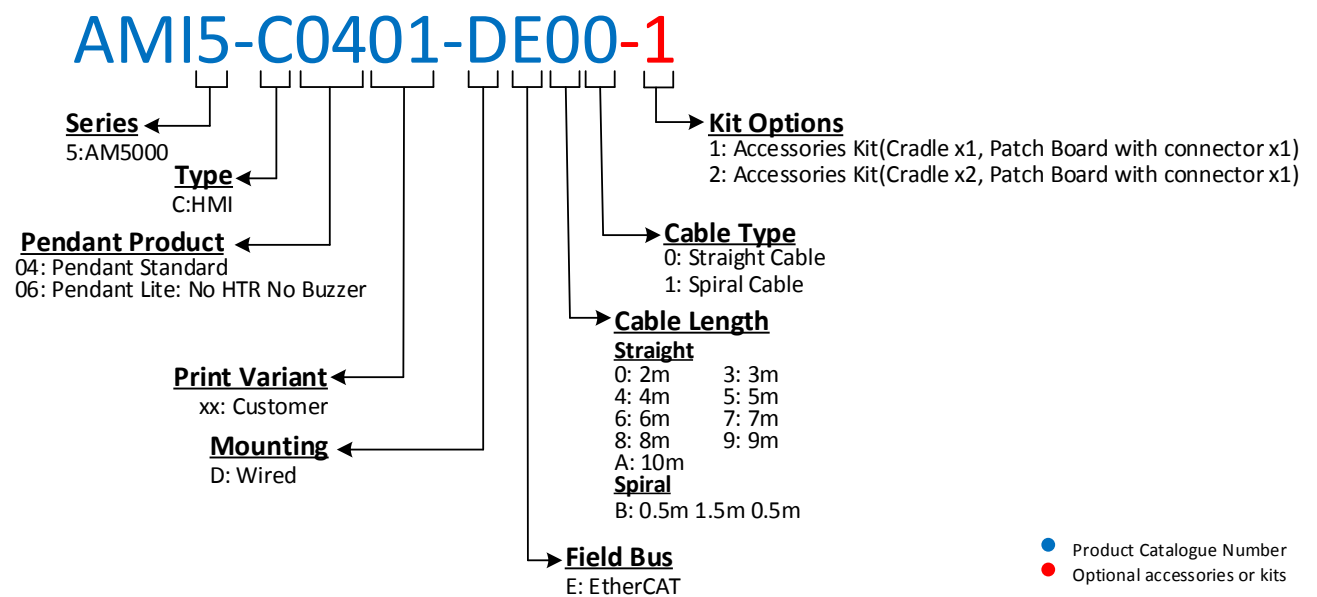


Figure 3-2 Remote Pendant Product Code Explanation

The red highlighted field indicates optional accessory kits that can be ordered with the Remote Pendant with the field appearing blank if the Remote Pendant is ordered on its own.

3.5 Remote Pendant Overview

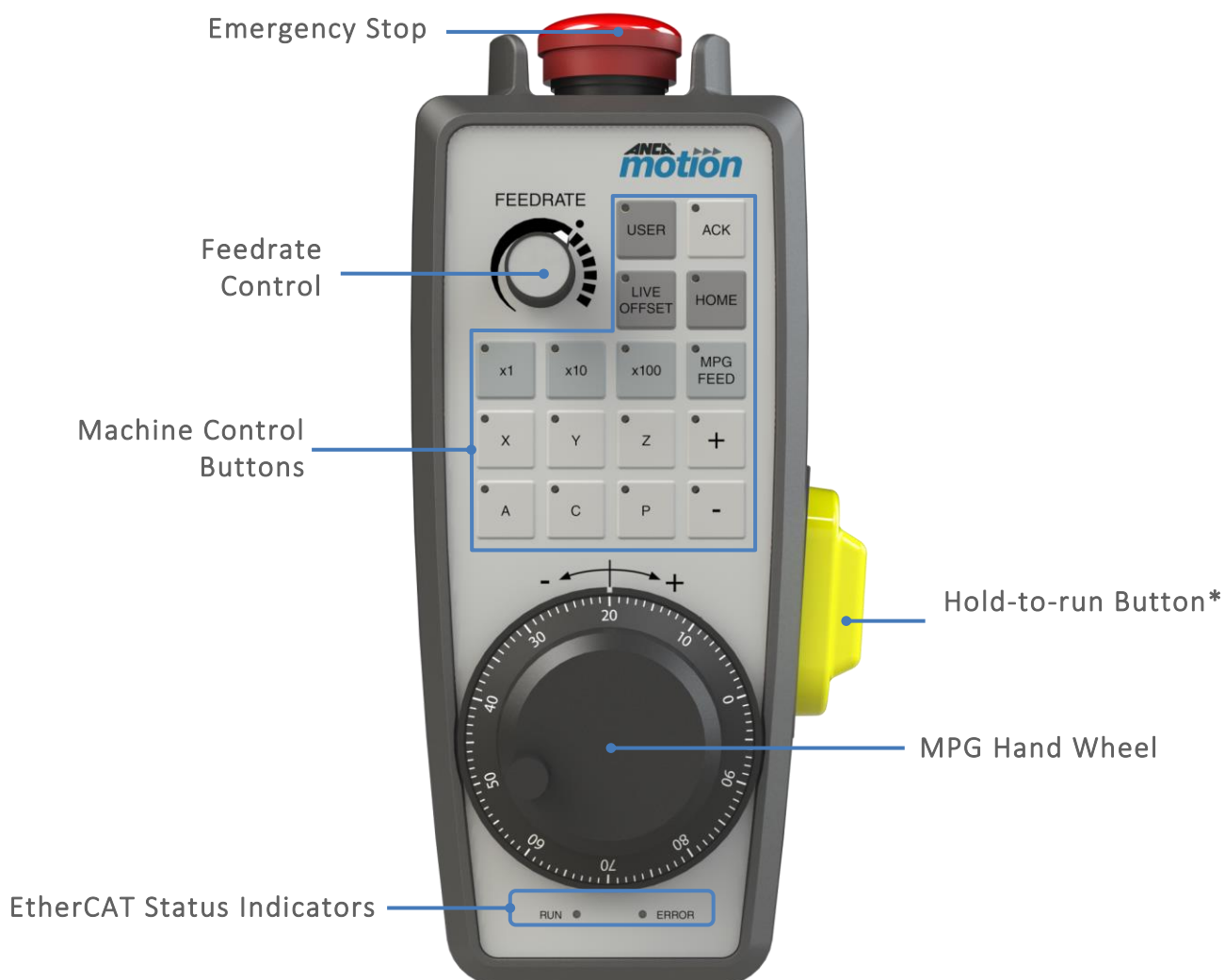


Figure 3-3 Overview Image of Remote Pendant

The AMI5000 Remote Pendant has many useful features as discussed in [3.2 Features](#). This image shows how the different controls are laid out on this handheld device. Note the Button Label text provided in this manual is one example and other options are available.

*Pendant Standard Only

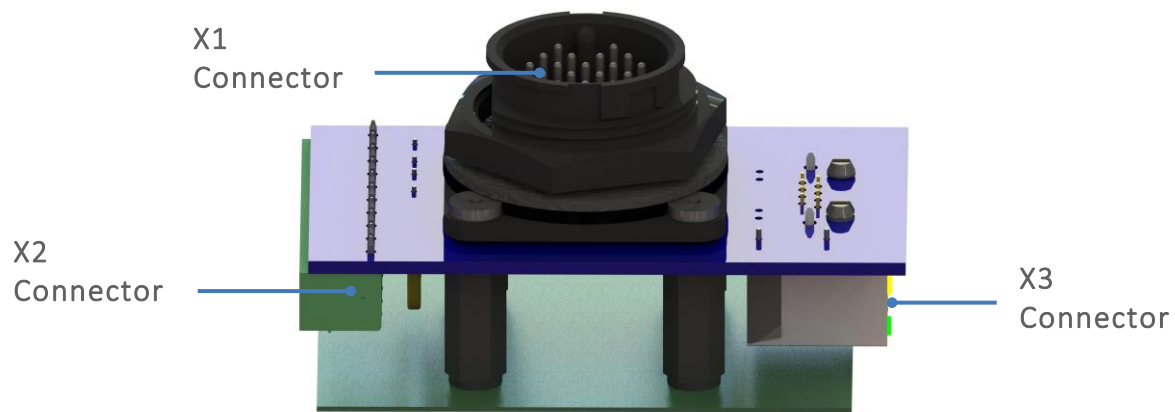


Figure 3-4 Overview Image of the Patch Board

The Pendant interfaces with the Control System through the Pendant Patch Board via the 18 pin circular cable connector. The patch board also has connectors for customer wiring EtherCAT communications. See section [5.2 Connector Overview](#) for more information.

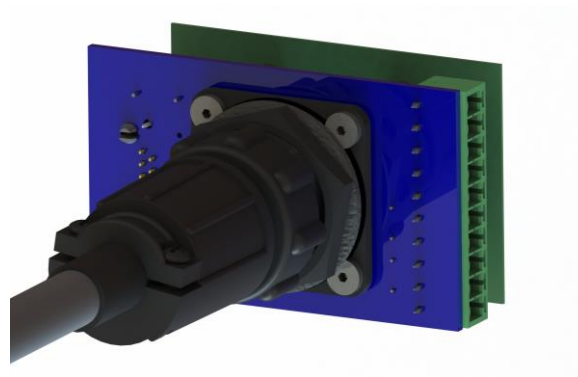


Figure 3-5 Patch Board with Wiring Plug



Figure 3-6 Remote Pendant Standard and Remote Pendant Lite in Cradle

The Cradle can be mounted on the end user equipment for easy storage of the Pendant.

3.6 Remote Pendant Dimension Drawings

3.6.1 Pendant Standard Mechanical Drawing (without cradle)

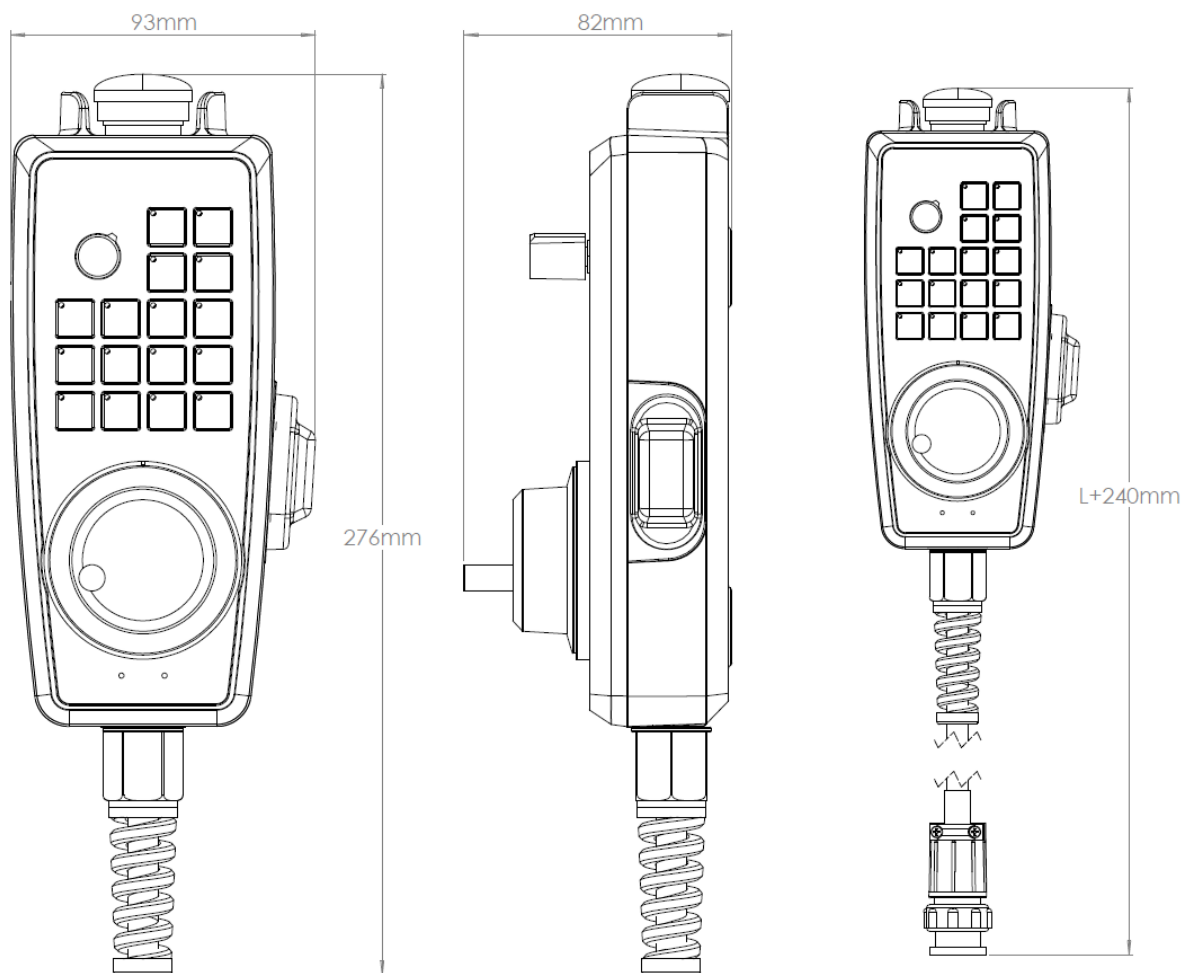


Figure 3-7 Remote Pendant Standard Dimensions (mm)

3.6.2 Pendant Lite Mechanical Drawing (without cradle)

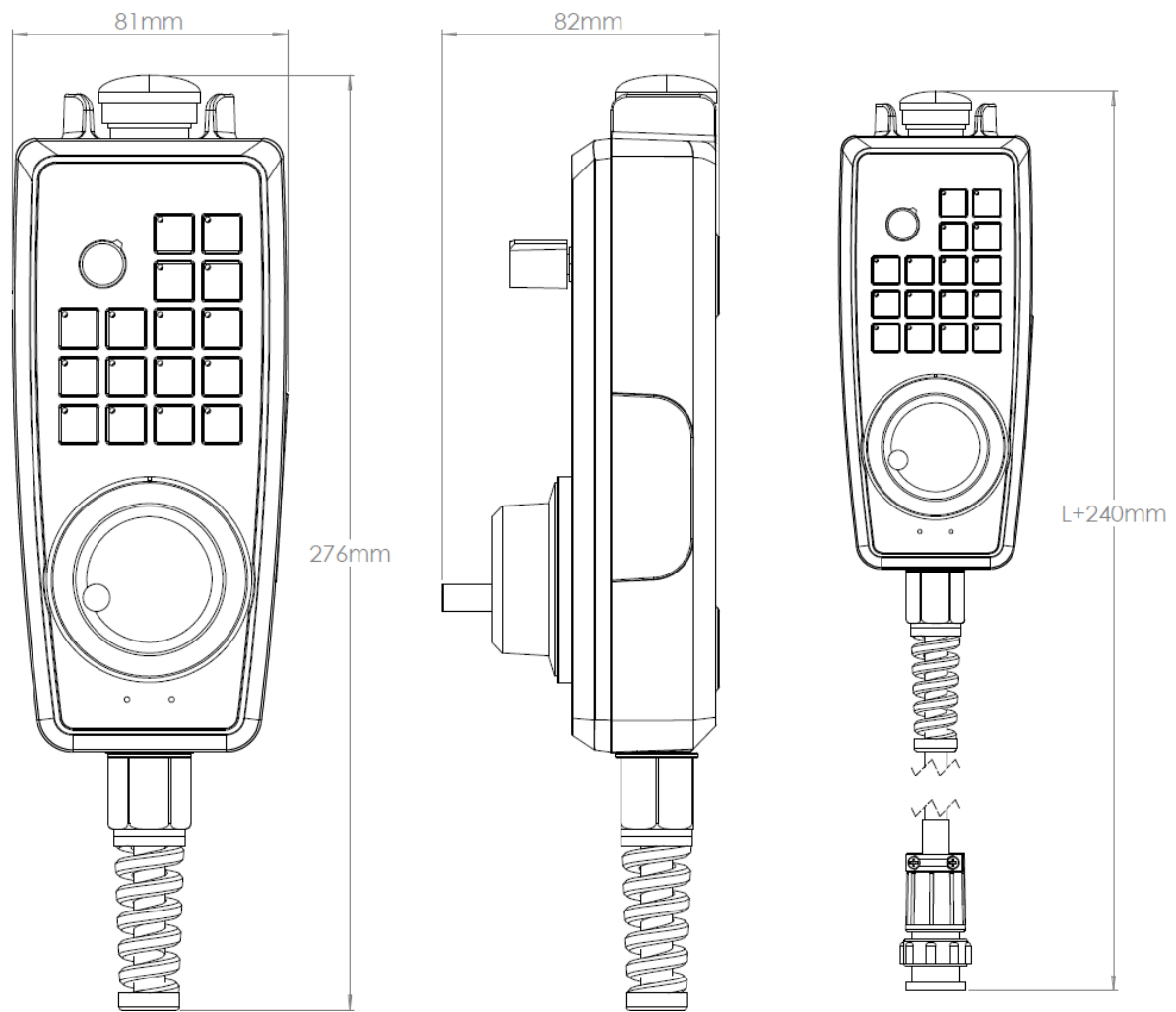


Figure 3-8 Remote Pendant Lite Dimensions (mm)

3.6.3 Pendant Standard Mechanical Drawing (with cradle)

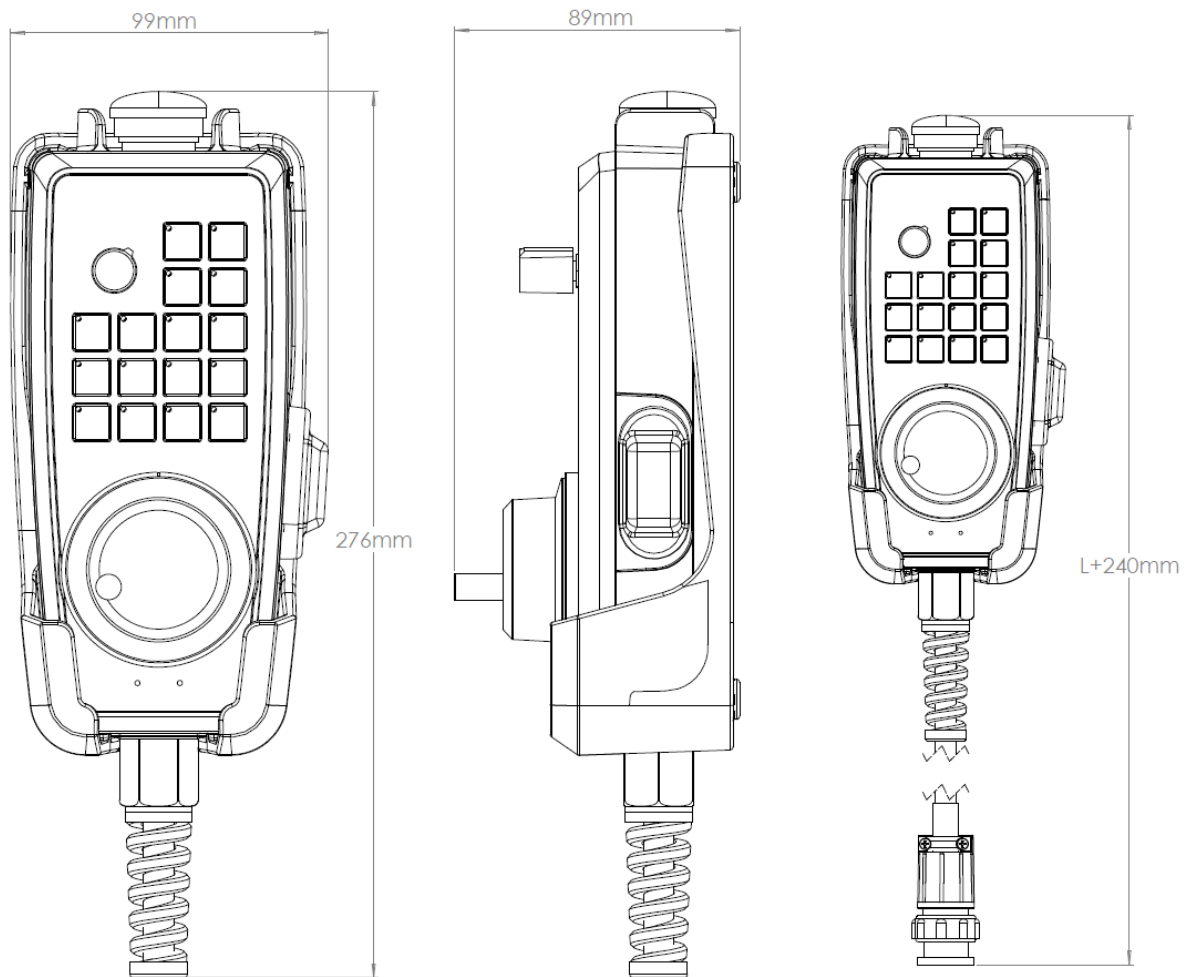


Figure 3-9 Remote Pendant Standard with Cradle Dimensions (mm)

3.6.4 Pendant Lite Mechanical Drawing (with cradle)

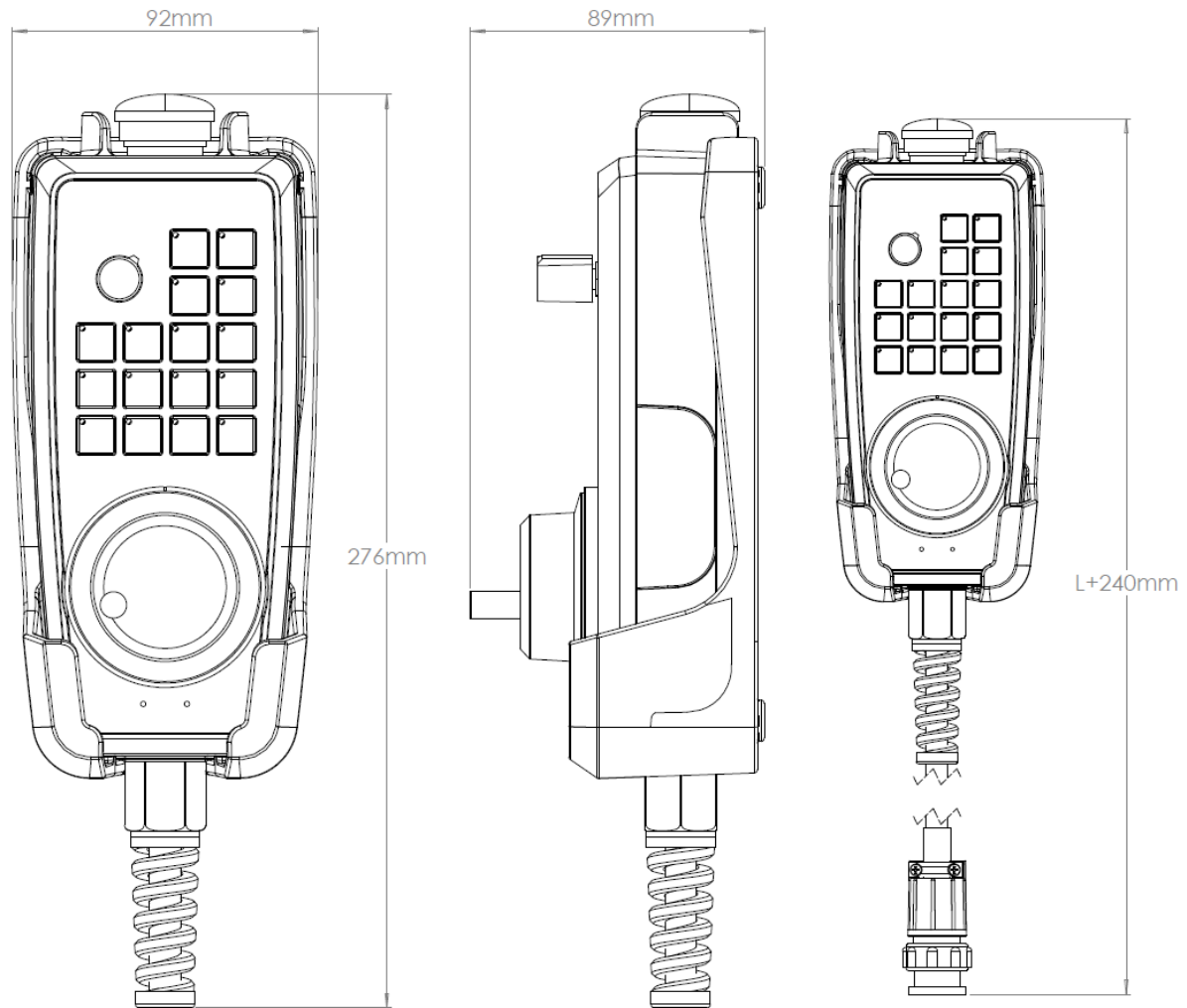


Figure 3-10 Remote Pendant Lite with Cradle Dimensions (mm)

3.6.5 Pendant Cradle Mechanical Drawing

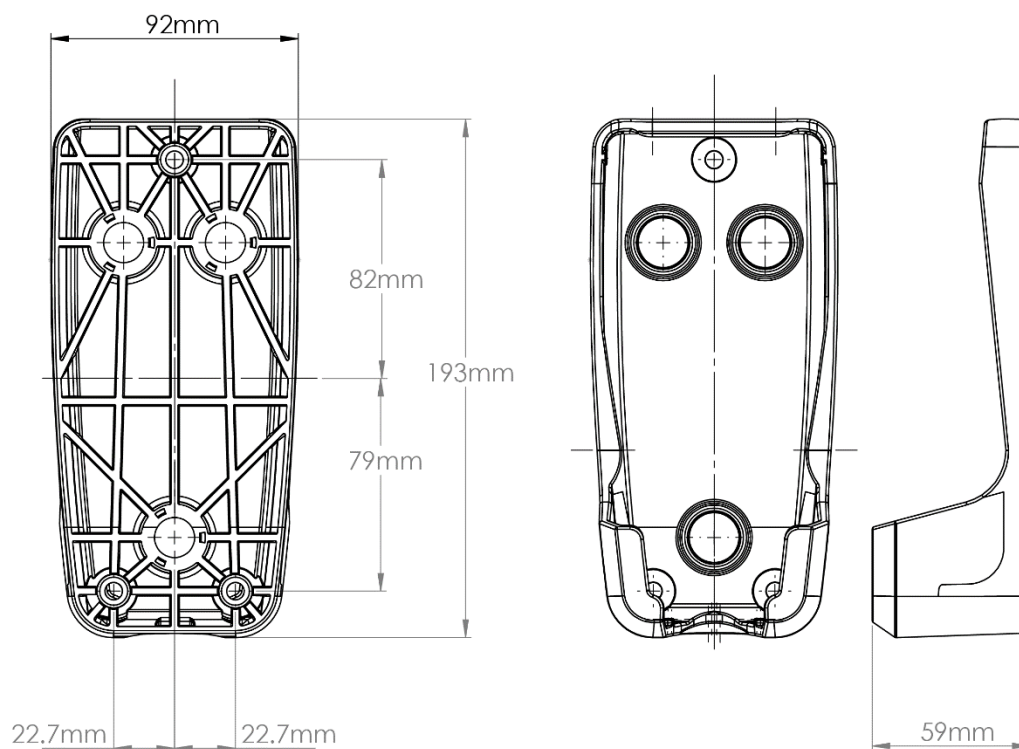


Figure 3-11 Remote Pendant Cradle Dimensions (mm)

3.6.6 Pendant Cradle Mounting Hole Pattern

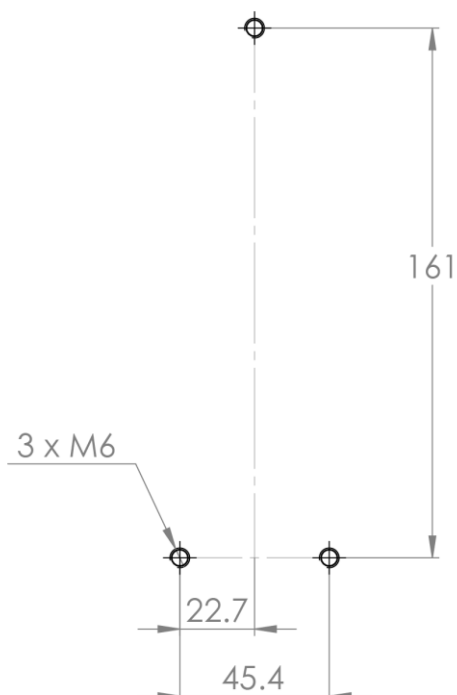


Figure 3-12 Remote Pendant Cradle Mounting Hole Pattern (mm)

3.6.7 Pendant Patch Board Mechanical Drawing

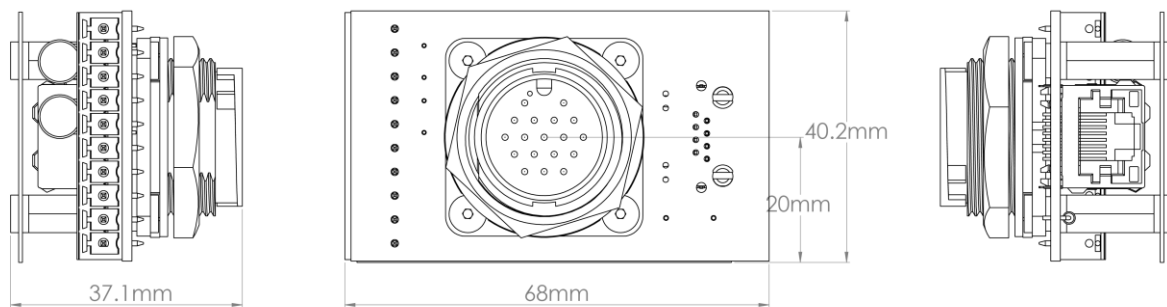


Figure 3-13 Patch Board Dimensions (mm)

3.6.8 Pendant Patch Board Cut-out Pattern

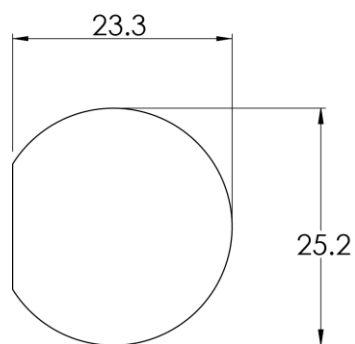


Figure 3-14 Patch Board Dimensions (mm)

4. Mechanical Installation

4.1 Introduction

This chapter describes mounting the Remote Pendant Cradle.

- Pre installation checks
- Installation site requirements
- Mounting

4.2 Pre installation checks

- Prior to installing the panel please refer to section [3.3 AMI5000 Remote Pendant Product Label Explanation](#) to ensure you have the correct variant for the application.
- Check that the Remote Pendant was not damaged during transport. Please notify your distributor/OEM immediately of damage

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 Remote Pendant must only be installed indoors.
- Refer to the [4.3.2 Mounting](#) for the correct installation process.
- The safety precautions outlined in [1 Safety](#) must be understood and adhered to.
- The operating environment must not contain corrosive substances, metal particles, dust, condensation, flammable substances and gases.
- The Remote Pendant and Remote Pendant Cradle must not be installed in an environment in which the pollution degree exceeds PD2.

4.3.2 Mounting

- The AMI5000 Remote Pendant may be installed vertically or on any angled surface less than vertical.
- Ensure 50mm of free air surrounds the Remote Pendant.
- The Remote Pendant must not be installed in the vicinity of other heat generating equipment or devices
- The AMI5000 Remote Pendant Cradle should be mounted on a sheet metal panel with a minimum thickness of 1mm and a maximum distortion of 0.5mm per meter flatness across the back of the cradle.

4.4 Installation

4.4.1 Mounting the Remote Pendant Cradle

Refer to section [3.6 Remote Pendant Dimension Drawings](#) for Remote Pendant dimensions and mounting hole positions.

STEP 1

Drill and tap three M6 holes to suit the mounting hole pattern described in section [3.6.6 Pendant Cradle Mounting Hole Pattern](#)

STEP 2

Place the cradle so that the holes line up with the holes in the end user equipment.

STEP 3

Secure the cradle to the end user equipment by fitting M6 screws into the mounting holes to complete the mounting. Tighten the three mounting screws to 4Nm.

STEP 4

Place the Pendant into the cradle, it will be held securely in place by 3 magnets. Connect the appropriate electrical cables to the Patch Board as per section [5 Electrical Installation](#).

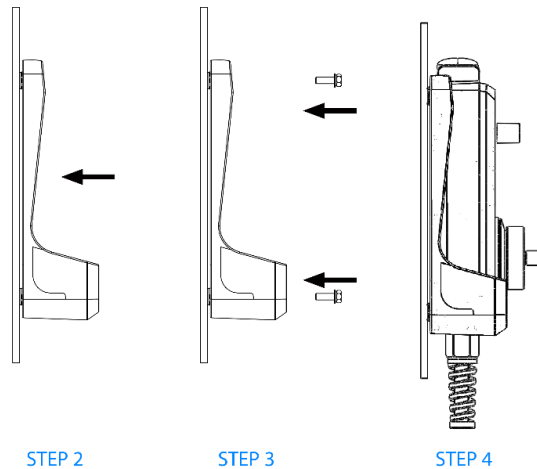


Figure 4-1 Mechanical Mounting of AMI5000 Remote Pendant

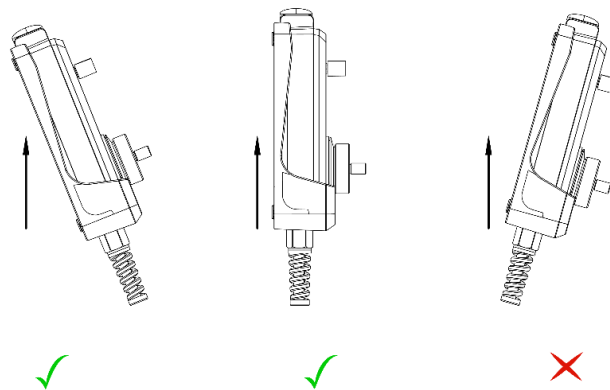


Figure 4-2 Allowable Mounting Angle

5. Electrical Installation

5.1 Introduction

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

- Connector Overview
- Connection and wiring diagrams
- Communications wiring

The AMI5000 Remote Pendant 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.

5.2 Connector Overview

5.2.1 AMI5000 Remote Pendant Patch Board

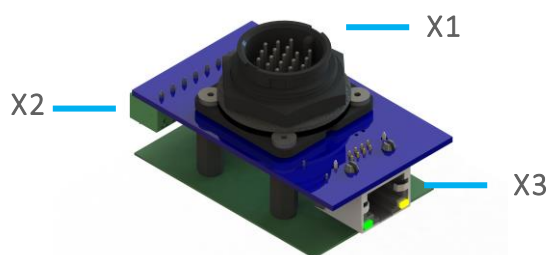


Figure 5-1 Mechanical Mounting of AMI5000 Remote Pendant

5.2.1.1 X1 - Remote Pendant Circular Connector

Connector	Designator	Function	Mating Connector
18 Pin Circular Connector	X1	Connects Pendant to Pendant Patch Board	Supplied with Pendant

5.2.1.2 X2 – Power Supply and Safety Interface Connector

Connector	Designator	Function	Mating Connector
Phoenix Socket MC 1,5/10-G-3,81	X2	Provides Power and Safety Wiring to the Pendant	Phoenix FK-MCP 1,5/10-ST-3,81

5.2.1.2.1 Power Supply Pin Assignment

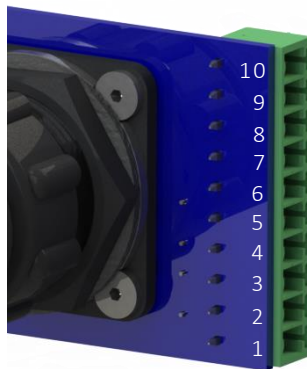


Figure 5-2 Pin location of X2 on Patch Board

5.2.1.3 X3 - EtherCAT connector

Connector	Designator	Function	Mating Connector
RJ45	X3	EtherCAT Cable	8P8C modular connectors

5.2.1.3.1 EtherCAT Connector Pin Assignment

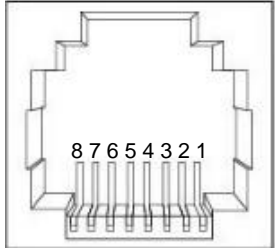
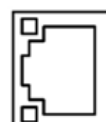
Connector	Pin Number	Label
	1	TX+
	2	TX-
	3	RX+
	4	N/C
	5	N/C
	6	RX-
	7	N/C
	8	N/C

Table 2 EtherCAT connector Pin Assignment

The Ethernet connector has two indicator LEDs, only one is used in this application. A green LED, located on the connector, signals that the ethernet cable has been linked or is active (receiving or transmitting data).

Link/activity

Not used



5.3 Wiring Diagram

Figure 5-3 shows the typical wiring diagram for the remote pendant, pendant patch board, user safety system, 24VDC power supply and CNC host controller.

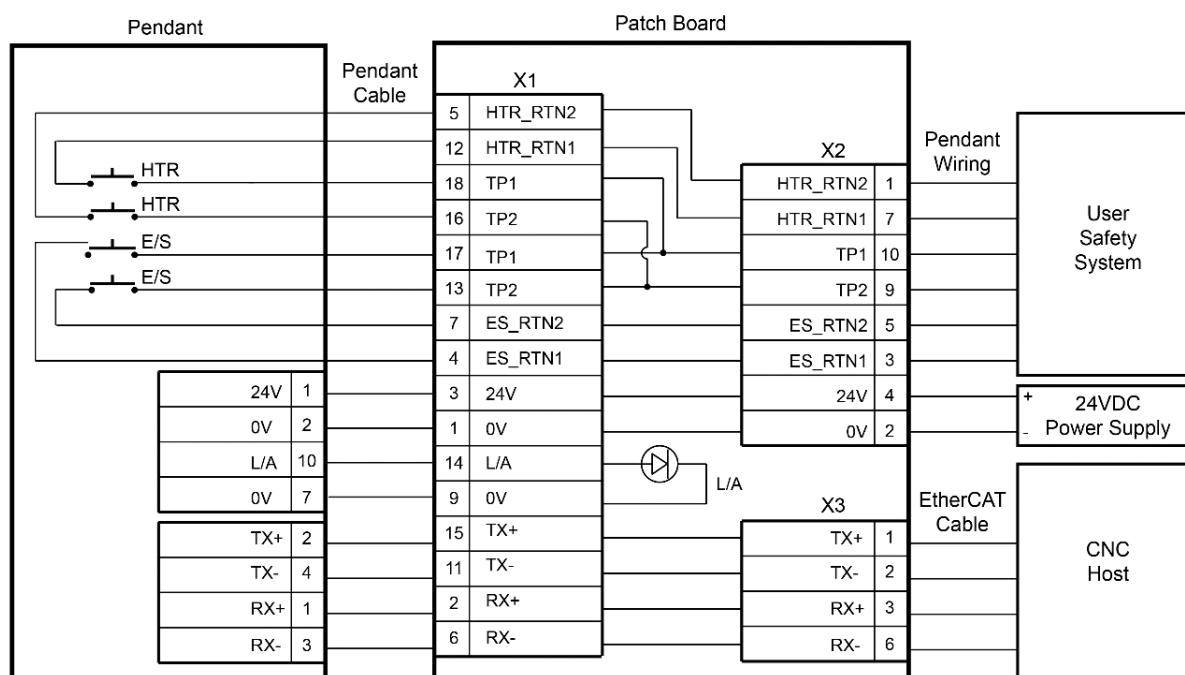


Figure 5-3 Wiring of the Remote Pendant

5.3.1.1 Pendant Wiring (Power Supply and Safety System Integration)

The 24VDC power supply may be a suitable unit capable of supplying the specified current to the pendant. The safety wiring should connect to the connector marked X2 as shown. The power supply and safety system integration wiring are supplied by the end user.

The supply current at 24VDC is 100mA maximum.

5.3.1.2 EtherCAT Cable

Standard EtherCAT cables are used to connect the Remote Pendant to other EtherCAT devices. The following types of cables must be used with 8P8C modular connectors. They are commonly referred to as “RJ45 shielded patch leads”.

Cable	Name	Cable Shield	Pair Shielding
Cat 5e or Above	F/UTP	Foil	None
	SF/UTP	Screen and Foil	None

- TP = Twisted pair
- U = Unscreened pairs
- F = Foil
- S = Screened (Braid type)

Either straight or crossover cables may be used.

Recommended cables are listed in the accessories section [14 Accessories](#).

6. Communication

6.1 EtherCAT®¹

The AMI5000 Remote Pendant supports communication using the EtherCAT protocol. This protocol provides deterministic communication over a standard 100Mbit/s (100Base-TX) Fast Ethernet (IEEE802.3) connection.

The Remote Pendant functions as an EtherCAT slave device with only one INPUT port. An expansion port to another EtherCAT device is not possible as there is no OUTPUT port on the patch board.

The Remote Pendant is capable of operating in an EtherCAT system with a Master update rate of 1ms.

¹ EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

7. Safety Devices

7.1 Connection of Safety Devices

The pendant contains two safety switches. An emergency stop switch is located at the top of the pendant and a hold to run switch (Pendant Standard only) is located on the side of the pendant.

These two devices are wired from the pendant to the patch board via the supplier pendant cable. The user can connect to these devices at the connector marked X2 on the patch board. See the Specification Document for ratings.

The safety system used for connection of the E/Stop and the Hold-to-Run devices are user supplied.

8. Installation checklist for the Remote Pendant

8.1 Introduction

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

8.2 Installation Checklist

	The installation location satisfies the requirements in 4Mechanical Installation
	The supply voltage is within the operating limits of operation of the Remote Pendant. (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 Remote Pendant is ready for start-up
	A risk assessment has been completed on entire machine and is considered by the user to be safe enough for operation

9. Configuring the Remote Pendant

9.1 Introduction

This chapter contains configuration data for the remote pendant. It also includes information on the Frame Packet Mapping.

9.2 Frame Packet Mapping

9.2.1.1 Inputs

The following table describes the input frame mapping from the Remote Pendant to an EtherCAT master:

INPUT TYPES	ACTIVATED	NOT ACTIVATED	DESCRIPTION	UNIT	SIZE
Tactile Switches	Press -1 (logic)	Release -0 (logic)	n/a	n/a	16 bits
Temperature	n/a	n/a	Internal temperature	C°	8 bits
Analog (Pot)	n/a	n/a	Feedrate control	n/a	8 bits
MPG	n/a	n/a	Quadrature encoder	n/a	32 bits

Table 3 Input Types

The Input Frame Packet for the Remote Pendant is detailed in the following table:

Remote Pendant Input Frame Packet (Slave→ Master)							
0	1	2	3	4	5	6	7
IPB 1 - 8	IPB 9 - 16	IPI1	IPI2	IPI3		IPI3	
SW1-SW8	SW9-SW16	Temperature	Analog (Pot)	MPG (lowest byte)	MPG (2nd low byte)	MPG (2nd high byte)	MPG (highest byte)

Table 4 Input Types

9.2.1.1.1 Booleans Inputs

IP#	Remote Pendant Button Label	Frame Packet (Boolean Inputs)
IPB1 - SW1	USER	Boolean Base + 1
IPB2 - SW2	ACK	Boolean Base + 2
IPB3 - SW3	LIVE OFFSET	Boolean Base + 3
IPB4 - SW4	HOME	Boolean Base + 4
IPB5 - SW5	x1	Boolean Base + 5
IPB6 - SW6	x10	Boolean Base + 6
IPB7 - SW7	x100	Boolean Base + 7
IPB8 - SW8	MPG FEED	Boolean Base + 8
IPB9 - SW9	X	Boolean Base + 9
IPB10 - SW10	Y	Boolean Base + 10
IPB11 - SW11	Z	Boolean Base + 11
IPB12 - SW12	+ (Plus)	Boolean Base + 12
IPB13 - SW13	A	Boolean Base + 13
IPB14 - SW14	C	Boolean Base + 14
IPB15 - SW15	P	Boolean Base + 15
IPB16 - SW16	- (minus)	Boolean Base + 16

Table 5 Boolean inputs from Remote Pendant micro controller to the EtherCAT master.

Example:

If the base for a Remote Pendant is 700, COLLET Button Press = IPB701. Note the Button Label text provided in this manual is one example and other options are available.

9.2.1.1.2 Integers Inputs

IP#	Remote Pendant Integer Output	Frame Packet (Integer)
IPI1	Temperature	Integer Base + 1
IPI2	Analog (Pot)	Integer Base + 2
IPI3	MPG	Integer Base + 3

Table 6 Integer Inputs from Remote Pendant micro controller to the EtherCAT master.

Example:

If the base for a Remote Pendant is 700, Feedrate Override Knob Output = IPI702

9.2.1.2 Outputs

The following table details the output frame mapping from the EtherCAT master to the Remote Pendant.

OUTPUT TYPES	ACTIVATED	NOT ACTIVATED	DESCRIPTION	SIZE
LEDS	LIGHT ON-1 (logic)	LIGHT OFF-0 (logic)	n/a	bit
Buzzer	BUZZER ON-1 (logic)	BUZZER OFF-0 (logic)	Activate/Deactivate buzzer	bit

Table 7 Output Types

The Output Frame packet for the Remote Pendant is shown in the following table:

Remote Pendant Output Frame Packet (Master→Slave)		
0	1	2
OPB 1 - 8	OPB 9 - 16	OPB17-OPB24
LEDS	Buzzer, LEDS	

Table 8 Output Frame Packet from Master to Slave.

9.2.1.2.1 Boolean Outputs

OP#	Front Panel Label	Frame Packet (Boolean Output)
OPB1	USER LED	Boolean Base + 1
OPB2	ACK LED	Boolean Base + 2
OPB3	LIVE OFFSET LED	Boolean Base + 3
OPB4	HOME LED	Boolean Base + 4
OPB5	x1 LED	Boolean Base + 5
OPB6	x10 LED	Boolean Base + 6
OPB7	x100 LED	Boolean Base + 7
OPB8	MPG FEED LED	Boolean Base + 8
OPB9	X LED	Boolean Base + 9
OPB10	Y LED	Boolean Base + 10
OPB11	Z LED	Boolean Base + 11
OPB12	+ (Plus) LED	Boolean Base + 12
OPB13	A LED	Boolean Base + 13
OPB14	C LED	Boolean Base + 14
OPB15	P LED	Boolean Base + 15
OPB16	- (minus) LED	Boolean Base + 16
OPB17	Buzzer	Boolean Base + 17
OPB18	All LEDs	Boolean Base + 18
OPB19	Reserved	Boolean Base + 19
OPB20	Reserved	Boolean Base + 20
OPB21	Reserved	Boolean Base + 21
OPB22	Reserved	Boolean Base + 22
OPB23	Reserved	Boolean Base + 23
OPB24	Reserved	Boolean Base + 24

Table 9 Boolean Outputs from ECAT Master to Remote Pendant.

10. Commissioning and Testing

10.1 Introduction

In a CNC, the tools provided within ANCA Motion AMCORE environment will provide for commissioning and diagnosis. An XML file will be provided to the end user.

10.1.1 Testing/ Power-On Checks

The following procedure must be adhered too 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.
3. All equipment connected to the Remote Pendant is ready for start-up
4. Start-up of the Remote Pendant will not result in any hazards in the current machine state of loading and accessibility
5. Ambient temperature is within -20 to +55° C.
6. A machine risk assessment has been performed and the machine has been assessed as safe to use.
7. Ensure the 24V input is within 20.4VDC to 28.8VDC.

11. Pendant EtherCAT Fault Diagnostics

11.1 Introduction

This chapter contains information that will guide the user in trouble shooting AMI5000 Series Remote Pendant communications errors. The following items will be discussed.

- Remote Pendant EtherCAT LED Indicator States
- Remote Pendant EtherCAT LED Indicator Blink Rates
- Remote Pendant Patch Board LED Indicator States

11.2 Fault Diagnosis

11.2.1 Remote Pendant Status LED Indicators

As shown in [Figure 11-1](#), two LED indicators are located on the Remote Pendant; EtherCAT Run and Error. The LEDs are Green (RUN) and Red (ERROR) in colour. The LED state and LED blink rates are detailed in [Table 10](#) and [Table 11](#).

The normal (working) state of the RUN and ERROR LEDs is On (RUN) and Off (ERROR) respectively.



Figure 11-1 EtherCAT Indicators

11.2.2 EtherCAT Run Indicator

State of LED	Description
On	The Remote Pendant is Operational
Flickering	The Remote Pendant is booting or downloading Firmware
Blinking	The Remote Pendant in the Pre-Op state
Single Flash	The Remote Pendant is in a Safe- Operational State
Off	The Remote Pendant is Off or is in an Initialisation State

Table 10 EtherCAT RUN LED Indicator states

11.2.3 EtherCAT Error Indicator

State of LED	Description
On	A critical communication or application error has occurred
Flickering	A booting error had been detected
Blinking	A general configuration error has occurred
Single Flash	A local error has occurred
Off	No Error has occurred and communication of the Remote Pendant is in working order

Table 11 EtherCAT ERROR LED Indicator states

11.2.4 EtherCAT RUN and ERROR Indicator Blink Rates

State of LED	Frequency
On	Constantly On
Flickering	10Hz, On for 50ms and off for 50ms
Blinking	2.5Hz, On for 200ms and off for 200ms
Single Flash	On for 200ms and off for 1000ms
Off	Constantly Off

Table 12 EtherCAT Indicator Blink Rates for RUN and ERROR

11.2.5 Pendant Patch Status LED Indicators

The EtherCAT Link/Activity (L/A) LED for the IN Port is located on the Remote Pendant Patch board as required by the EtherCAT standard. The states of the L/A LED are detailed in the following table. The L/A LED is green in colour.

The normal (working) state of the L/A LED is flickering.

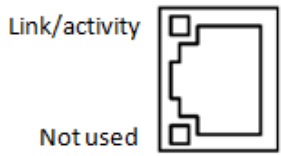
	State of LED	Activity	Link
	On	No	Yes
	Flickering	Yes	Yes
	Single Flash	No	No
	Off	N/A	No

Table 13 EtherCAT Link/Activity LED Indicator Blink Rates



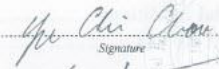

12. Standards Conformity

12.1 EtherCAT®² Conformance Marking

An EtherCAT device conformance mark is attached to the Product Label in order to verify that the unit has been tested for compliance with the EtherCAT marking, indicator and performance guidelines covered by the relevant ETG standards.

12.2 CE Marking

A CE mark is attached to the Product Label in order to verify that the unit meets the relevant 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	
 EMC TEST REPORT			
Applicant	: ANCA Motion Pty. Ltd. 1 Bessemer Road, Bayswater North VIC3153 Australia		
Manufacturer	: ANCA Motion Taiwan Co., Ltd. 1F, No.57, 37 Rd., Taichung Industrial Park Taichung 407 Taiwan		
Product Name	: AMI5000 Remote Pendant		
Model	: AMI5-C0400-DE00		
Series Model	: N/A		
Accessory	: MW/SP-150-24 (output: DC24V, 6.3A) Input: AC100-240V, 50Hz/60Hz		
Power Source	: DC 24V, 0.8A		
Test Date	: 2015/05/13 and 2015/05/14		
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, 37 th 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	June 16, 2015 Date
Approved by	Tim Hise	 Signature	June 16, 2015 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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² EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

12.3 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

FC 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 Remote Pendant

Model Name : AMI5-C0401-DEA0

Series Model : See the Section 1.4

Accessory : MW/SP-150-24 (output: DC24V, 6.3A)
Input: AC100-240V, 50Hz/60Hz

Power Source : DC 24V, 0.8A

Test Standards : FCC CFR Title 47 Part 15 Subpart B: 2005 Class A

Test Date : 2017/02/03

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. 02, 2017
Date

Approved by Tim Hise


Signature

Mar. 02, 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 Control Functions

Attribute	Qualification
13.1.1 User Interface	
Switches with LED indicators	16
Feedrate Potentiometer	Yes
MPG	Yes
Emergency stop	Yes
Hold-to-Run	Yes (Pendant Only)
13.1.2 Feedrate Potentiometer	
Mechanical Travel	300° +/-5°
Resistance	470 ohm +/-20%
Variation Law	Linear
13.1.3 MPG	
Supply Voltage	5 VDC +/- 10%
Max Supply Current	70 mA
Output Voltage	$V_H > 4V / V_L < 0.5 V$
Maximum Output Current	20 mA
Maximum Frequency Response	5 kHz
Pulse Per Rotation (PPR)	100
13.1.4 Emergency Stop	
Position	Mounted to top of Remote Pendant
Number normally closed contacts	2
Mechanism	Latching positive action
Actuating force	Approximately 15 N
Reset Mechanism	Rotary
Rated Voltage	30 VDC
Rated Current	1 A
Applicable Standards	EN 60947-5-1
	UL 508
	CSA C22.2 No.14
	GB14048.5

13.1.5 Hold-to-Run (Pendant Standard Only)	
Position	Mounted to Right Hand Side of Remote Pendant
Number normally closed contacts	2
Rated Voltage	30 VDC
Rated Current	1 A
Applicable Standards	EN 60947-5-1
	EN 60947-5-8
	GS-ET-22 (HE6B TDS)
	UL 508
	CSA C22.2 No.14
13.1.6 Tactile Switches	
Activate Force	160g
13.1.7 Buzzer (Pendant Standard Only)	
Frequency	2.9 kHz (Nominal)

13.2 Interface Specifications

<i>Attribute</i>	<i>Qualification</i>
13.2.1 Ethernet Interface	
Protocol	EtherCAT
Baud Rate	100 Mb/s
Connector	Ethernet RJ-45 (on Patch Board)
EtherCAT Master Cycle Time	1ms

13.3 Environmental Specifications

<i>Attribute</i>	<i>Qualification</i>
13.3.1 Storage	
Ambient Temperature	-20 to +55° C
Relative Humidity	5 to 95%
13.3.2 Installation and Operation	
Permissible Ambient Temperature at rated continuous current I_{aN}	0 to +50° C

Relative Humidity	5 to 85% non-condensing
Mechanical vibration	Within class 3M1 (IEC 60721-3-3)
Ingress Protection Rating	IP53

13.4 Electrical Specifications

13.4.1 Power Supply

Parameter	Specification			Units
	Min	Type	Max	
Voltage	20.4	24	28.8	V
Current	-	-	150	mA

Attribute	Qualification
13.4.2 Power Supply Protection	
Input Transient Protection	Yes
Reverse Polarity Protection	Yes

13.5 Mechanical Specifications

Attribute	Qualification
13.5.1 Physical Characteristics	
Mounting position in Operation	Vertical Preferred
Device Weight	1kg
Membrane	MaxDermid, Autotex® XE Fine: F200
Materials	
Case	Nylon + 30%GF
LED Light Pipe	TPU
13.5.2 Pendant Standard Dimensions	
Pendant Standard Dimensions Including Cradle	
Height (mm)	276mm
Width (mm)	99mm
Depth (mm)	89mm
Pendant Standard Dimensions Excluding Cradle	
Height (mm)	276mm
Width (mm)	93mm
Depth (mm)	82mm
13.5.3 Pendant Lite Dimensions	
Pendant Lite Dimensions Including Cradle	
Height (mm)	276mm
Width (mm)	92mm
Depth (mm)	89mm
Pendant Lite Dimensions Excluding Cradle	
Height (mm)	276mm
Width (mm)	81mm
Depth (mm)	82mm
13.5.4 Cable Characteristics	
Length	2m
Diameter	9.5mm

13.5.5 Patch Board Connectors

Connector - EtherCAT	EtherCAT IN (RJ45)
Connector - I/O	10 Way 3.81mm Phoenix Connector

14. Accessories

14.1 Introduction

This chapter contains summarized information on accessories options available for this Remote Pendant

- Ordering Information
- Details of Accessories

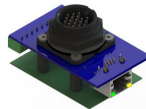
For additional details, please refer to full catalogue and information available via [14.7 Product, Sales and Service Enquiries](#)

14.2 Pendant Cradle



Part Number	Description
646-0-01-8367	Cradle Assembly

14.3 Pendant Patch Board

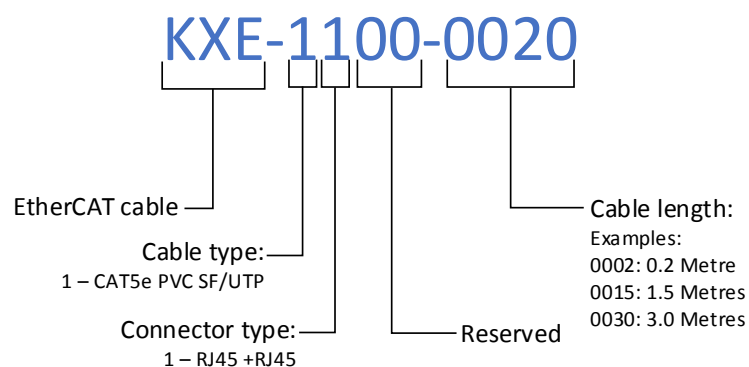


Part Number	Description
646-0-00-8366	Patch Board Assembly

14.4 EtherCAT Cables



Product code



Examples

Catalogue Number	Description
KXE-1100-0002	Ethernet Cable, Cat 5e, SF/UTP, 0.2m
KXE-1100-0015	Ethernet Cable, Cat 5e, SF/UTP, 1.5m
KXE-1100-0030	Ethernet Cable, Cat 5e, SF/UTP, 3.0m

14.5 Accessory Kits

The Remote Pendant is available in the following accessory kits designated by either -1 or -2:

Pendant Catalogue Number	Accessory Part Number	Description	Quantity
AMI5-C0XX-DEXX-1	646-0-00-8601	Remote Pendant Cradle	1
	646-0-00-8874	Patch Board Assembly	1
AMI5-C0XX-DEXX-2	646-0-00-8601	Remote Pendant Cradle	2
	646-0-00-8874	Patch Board Assembly	1

14.6 Maintenance and Repairs

There are no user serviceable parts inside the AMI5000 Remote Pendant. If the polyester is soiled, it can be wiped with a moist cloth and detergent. Do not use abrasive cleaners. For any repairs please contact our nearest office or agent. Refer to section [14.7 Product, Sales and Service Enquiries](#).

14.7 Product, Sales and Service Enquiries

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

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14.8 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

