

704-0001-717, Dec. 1994
ISA Control Package
Service Manual
Revision A - Proprietary

ISA Control Package Service Manual

Proprietary

HURCO Companies, Inc. reserves the right to incorporate any modifications or improvements in machines and machine specifications which it considers necessary, and does not assume any obligation to make any said changes in machines or equipment previously sold.

The information in this document is subject to change without notice and does not represent a commitment on the part of Hurco Companies, Inc. (Hurco). The software described in this document is furnished under a license agreement to customers. It is against the law to copy the software on any medium except as specifically allowed in the license agreement. The purchaser may make copies of the software for backup purposes. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, for any purpose without the express written permission of Hurco.

© 1994 Hurco Companies, Inc. All rights reserved. Printed in the United States of America.

Autobend is a trademark of Hurco Companies, Inc.

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Hurco has listed here all trademarks of which it is aware.

For more information on Hurco products and services, contact the corporate headquarters in Indianapolis, Indiana or one of the subsidiaries listed below:

Hurco Companies, Inc.
One Technology Way
P.O. Box 68180
Indianapolis, Indiana
46268-0180

TEL (317) 293-5309
FAX (317) 328-2812

Hurco Europe Ltd.
Lincoln Road
Cressex Industrial Estates
High Wycombe
Buckinghamshire, England

HP12 3TH
TEL 001 44 494 442222
FAX 011 44 494 4444646

Autocon Technologies, Inc.
38455 Hills Tech Drive
Farmington Hills, Michigan
48331-5751

TEL (810) 488-0440
FAX (810) 488-0430

Hurco GmbH
Benzstrasse 8
85551 Kirchheim
Munich, Germany

TEL 011 4989 9050 9434
FAX 011 4989 9050 9450

Central Hurco s.a.r.l.
Parc d'activite Charles de Gaulle
5, rue Jean Monet
95190 Goussainville France

TEL 011 33 1 39886 400
FAX 011 33 1 39929 483

Hurco Southeast Asia Pte Ltd
No. 37 Lorong 23 Geylang
#0501, Yu Li Industrial Building
Singapore 1438

Republic of Singapore
TEL 011 65 742 6177
FAX 011 65 745 7664

Hurco West
5860 Arlington Ave.
Suite "M"
Riverside, CA 92504

TEL (909) 358-2340
FAX (909) 358-2335

Autocon GmbH
Kolpingring 12
D-82041 Oberhaching
Germany

TEL 001 4989 625 2012
FAX 011 4989 625 2014

Using This Manual

The *ISA Control Package* includes descriptions and drawings for the ISA Control Package. This manual employs several conventions to explain the system concepts and point out key concepts. These conventions are described in this section.

Sections of the Manual

This manual is divided into these chapters:

- Chapter 1 - Introduction
- Chapter 2 - System Overview
- Chapter 3 - Cables
- Chapter 4 - CPU Board
- Chapter 5 - CANbus Controller Board
- Chapter 6 - CANbus DC I/O Backplane
- Chapter 7 - CANbus DC I/O Node Board
- Chapter 8 - I/O Interface Board
- Chapter 9 - Motion Controller Board
- Chapter 10 - Dual VGA Board
- Chapter 11 - Hard Drive Assembly
- Chapter 12 - Floppy Disk Drive Transceiver Board
- Chapter 13 - Floppy Drive Assembly
- Chapter 14 - CANbus Console Interface Node (CIN) Board
- Chapter 15 - CANbus Jog Functions
- Chapter 16 - Other CIN Input Devices
- Chapter 17 - Text and Graphics Monitors
- Chapter 18 - DC Power and Distribution Board
- Chapter 19 - Card Cage and Card Rack
- Chapter 20 - Control Resident Diagnostics

Table of Contents

Chapter 1 Introduction

ISA Package	1-1
Standard Computer Components	1-1
Hurco Mill Components	1-1
System Component Overview	1-2
CPU Board	1-2
ISA Bus	1-3
CANbus	1-3
Dual VGA Board	1-3
Motion Controller Board	1-3
I/O Interface Board	1-3
CANbus Controller Board	1-3
CANbus DC I/O Backplane Board	1-4
CANbus DC I/O Node Board	1-4
CANbus Console Interface Node (CIN)	1-4
CANbus Jog Board	1-4
Power Supply	1-4
Power Distribution Board	1-4
Disk Drives and Controllers	1-4
Floppy Drive Remote Transmitter/Receivers (Transceivers)	1-4
Monitors	1-4
Serial Ports, Parallel Ports, Software Security Device	1-4

Chapter 2 System Overview

General Information	2-1
System Operation	2-1
System Troubleshooting	2-2
Error Messages	2-2
System Reset	2-2
Emergency Stop	2-3
Diagnostics	2-3

Chapter 3 Cables

General Information.....	3-1
Troubleshooting Suggestions.....	3-1
Cable Diagrams and Drawings	3-2
Block Diagrams	3-2
Wiring Drawings.....	3-2

Chapter 4 CPU Board

General Information.....	4-1
Functional Description	4-1
I/O and Cable Connections.....	4-1
Normal Configuration.....	4-2
Memory.....	4-2
Configuration.....	4-2
BIOS Setup	4-2
Troubleshooting.....	4-3
Beep Codes	4-3
Error Messages	4-3
Replacing CPU Items	4-5
Replacing Memory SIMMs.....	4-5
Replacing the CPU Board.....	4-5
Drawing	4-6

Chapter 5 CANbus Controller Board

General Information.....	5-1
Functional Description	5-1
I/O and Cable Connections.....	5-2
Normal Configuration.....	5-2
Troubleshooting.....	5-2
Replacing the CANbus Controller Board	5-3
Drawings	5-3

Chapter 6 CANbus DC I/O Backplane

General Information.....	6-1
Functional Description	6-1
I/O and Cable Connections	6-1
Troubleshooting.....	6-1
Replacing the Board	6-2
Drawings	6-2

Chapter 7 CANbus DC I/O Node Board

General Information	7-1
Functional Description	7-1
I/O and Cable Connections	7-1
Normal Configuration	7-1
Troubleshooting	7-2
Replacing the CANbus DC I/O Node Board	7-2
Drawings.....	7-2

Chapter 8 I/O Interface Board

General Information	8-1
Functional Description	8-1
I/O and Cable Connections	8-1
Troubleshooting	8-2
Replacing the Board.....	8-3
Drawings	8-3

Chapter 9 Motion Controller Board

General Information	9-1
Functional Description.....	9-1
I/O and Cable Connections	9-1
Normal Configuration and Adjustment.....	9-2
Troubleshooting	9-2
Replacing the Board.....	9-2
Drawing.....	9-2

Chapter 10 Dual VGA Board

General Information	10-1
Functional Description.....	10-1
I/O and Cable Connections	10-1
Normal Configuration	10-1
Troubleshooting	10-2
Replacing the Board.....	10-2
Drawing.....	10-2

Chapter 11 Hard Drive Assembly

General Information	11-1
Functional Description	11-1
I/O and Cable Connections	11-1
Troubleshooting	11-2
Replacing the Drive.....	11-2

Chapter 12 Floppy Drive Transceiver Board

General Information.....	12-1
Functional Description	12-1
I/O and Cable Connections.....	12-1
Troubleshooting.....	12-2
Replacing the Board	12-3
Drawings	12-3

Chapter 13 Floppy Drive Assembly

General Information.....	13-1
Functional Description	13-1
I/O and Cable Connections.....	13-1
Normal Configuration.....	13-1
Troubleshooting.....	13-2
Replacing the Drive	13-2

Chapter 14 CANbus Console Interface Node (CIN)

General Information.....	14-1
Functional Description	14-1
I/O and Cable Connections.....	14-2
Normal Configuration.....	14-2
Troubleshooting.....	14-2
The Keypress Communications Cycle	14-2
Troubleshooting the Cycle	14-3
Replacing the Board	14-3
Drawings	14-4

Chapter 15 CANbus Jog Function

General Information.....	15-1
Functional Description	15-1
I/O and Cable Connections.....	15-1
Normal Configuration.....	15-2
Troubleshooting.....	15-2
The Keypress Communications Cycle	15-2
Troubleshooting the Cycle	15-2
Troubleshooting Table	15-3
Replacing Jog Items.....	15-4
Local/Console Jog.....	15-4
Remote Jog	15-4
Drawings	15-4

Chapter 16 Other CIN Input Devices

General Information	16-1
Notes on CIN assemblies.....	16-1
Troubleshooting.....	16-2
The Keypress Communications Cycle	16-2
Troubleshooting the Cycle.....	16-2
Replacing Labels	16-2
Program Entry Keys	16-3
Replacing Program Entry Keys	16-3
Machine Operation Keys	16-3
Troubleshooting.....	16-3
Replacing Machine Operations Keys.....	16-3
Console Pushbuttons	16-4
Troubleshooting.....	16-4
Replacing Pushbutton Switches.....	16-4
Replacing A Pushbutton Light.....	16-4
Softkeys.....	16-5
Replacing Softkeys.....	16-5
Other Input Devices	16-5
E-Stop Switch.....	16-5
Program Protect Keypad	16-5
Remote Jog Interlock.....	16-5
Trackball Assembly.....	16-6
Troubleshooting.....	16-6
Replacing the Trackball.....	16-6
Drawings	16-6

Chapter 17 Text and Graphics Monitors

General Information	17-1
Functional Description	17-1
I/O and Cable Connections	17-1
Normal Configuration	17-1
Troubleshooting	17-2
Replacing a Monitor.....	17-2
Drawing.....	17-2

Chapter 18 DC Power and Distribution Board

General Information.....	18-1
Functional Description	18-1
I/O and Cable Connections.....	18-1
Normal Configuration.....	18-1
Troubleshooting.....	18-2
Replacing the Boards.....	18-2
Drawings	18-2

Chapter 19 Control Card Rack

Drawings	19-1
----------------	------

Chapter 20 Control Resident Diagnostics

General Information.....	20-1
Power On System Tests (POST)	20-3
Interactive Diagnostics	20-4
Cycle Tests.....	20-6
Auto Cycle Test.....	20-6
CANbus I/O Interface Board Test	20-8
CANbus DCIO Board I/O Test.....	20-8
Serial Port Test	20-9
Comprehensive Tests	20-10
Test Connector/Cable Connections	20-10
CANbus I/O Interface Board I/O Test Connector	20-10
CANbus DCIO Board I/O Test Cable Connection	20-11
RS-232 Serial Ports Test Connector	20-11
Motion Controller Board Test Cable Connection	20-11
Input/Output Tests	20-11
CANbus I/O Interface Input/Output Test.....	20-12
Display System Switch Settings	20-15
CANbus DCIO #1 & #2 Board Test.....	20-15
RS-232 Serial Port Tests	20-19
Port Testing	20-19
Motion Controller Test.....	20-21
Load Test	20-21
DAC Test	20-22
Marker Pulse Test.....	20-23
Probe Trigger Test.....	20-25

Console Tests.....	20-26
Keyboard Test	20-27
Text Test	20-28
Crosshatch Test.....	20-28
Color Bar Test.....	20-29
LED Test	20-29
CRT Adjust.....	20-30
Continuous Disk Test	20-30
Drawings	20-31