AutoMate® Local I/O Head

M/N 61C22 M/N 61C23

Instruction Manual J-3871-2



The information in tria user's manual is subject to change without notice.

DANGER

ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS EQUIPMENT AND THE HAZARDS INVOLVED SHOULD INSTALL, ADJUST, OPERATE, AND/OR SERVICE THIS EQUIPMENT. READ AND UNDERSTAND THIS MANUAL IN ITS ENTIRETY BEFORE PROCEEDING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

WARNING

INSERTING OR REMOVING THE LOCAL I/O HEAD OR ITS CONNECTING CABLES MAY RESULT IN UNEXPECTED MACHINE MOTION OR LOSS OF CONTROL. STOP THE MACHINE OR PROCESS AND DISCONNECT POWER TO THE SYSTEM BEFORE INSERTING OR REMOVING THE HEAD OR ITS CONNECTING CABLES. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN BODILY INJURY.

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1.0 INTRODUCTION

The products described in this instruction manual are manufactured or distributed by Reliance Flochic Industrial Company.

The Local I/O Head increases the number of RAIL ports available for connecting Rails and Rail-compatible devices such as LED and TWS modules to AutoMate and DCS 5000/AutoMax systems. One AutoMate Local I/O Head allows you to connect up to 64 points of digital I/C. 16 points of analog I/O, or a combination of the two, to sach of the four RAIL points on the models listed below. Note that the various AutoMate Processor models will support different amounts of total system. 70.

- AutoMate 20 Processor
- AutoMate 30 Processor
- AutoMate 40 Processor (M/N 46C400 or M/N 46C409).
- AutoMate Local (/O Processor M/N 4sC200)
- AutoMata Bamota UO Head M/N 45G37, 45G35.
- DOS 5000/AutoMax Remote (/0 Head M/N 45033/570339 N
- The Analog Rail modules (e.g., M/N 61C350, 61C351) cannot be used with the Local I/O Head in this configuration.

This remainder of this menual describes the functions end specifications of the Local I/O Head. It also includes an overview of installation and servicing procedures.

1.1 Additional Information

You should be familiar with the instruction manuals which describe your system configuration. This may include, but is not limited to the following:

- J-3012 AutoMate Digital (-O Rail and Modules Instruction Manual
- J 3031 AutoMate 30 Processor Hardware Instruction Manual
- J 33G3 AutoMate Local (/C Processor Instruction Manual)
- J-3047 AutoMate Remote UO Head Instruction Manual
- J 3063 AutoMate Programming Descutive Instruction Manual.
- J-3120 AutoMate 20 User's Manual
- J-3140 AutoMate 40 Engle Processor Instruction Manual.
- J-3150 AutoMate 30/40 Software Instruction Manual
- J-36a0 ReSource AutoMax Programming Executive Instruction Manual
- Jk3649 DOS 5000/AutoMax Configuration Task Instantion Manual
- J-388/ ReSource AutoMax Programming Executive Instruction Manual Variabn 2.0
- J-3750 ReSource AutoMax Programming Executive Instruction Manual Version 3-0

- E/M 0-15C33 DCS 5000/AutoMsx Remote I/O Head Instruction Manual
- Other instruction manuals applicable to your hardware configuration
- IEEE 518 SUIDE FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT TO MINIMIZE ELECTRICAL NOISE INPUTS TO CONTROLLERS

1.2 Related Hardware and Software

M/N IS1C28 or M/N 51C23 contains one Local KO Head, one 10" Local (KO interface cable (M/N 45C8), and two retainer clies for the cable. One Local (KO Head can connect up to four of the devices listed below (in any combinet on) to the AutoMate or DCS. 5000/AutoMax system:

- AutoMare Digital Input/Output Ball M/N 4501--16 points eligital (/).
- Analog Bali module (in AutoMote systems only) M/N 610350, 61 0351, etc.-4 points analog 70 per rsll, 16 total cer Local I/O -Hese in the BAll, mode
- LED module M/N 450631
- Inumborhael Switch module M/N 49G830.

All of the models listed above come with an I/C Rail cable, M/N 45/Co.

2.0 MECHANICAL/ELECTRICAL DESCRIPTION

The Local I/O Heeds incorporate a custom chip and an internal power supply. Model Numbers & C22 and 61 G23 are identical except for the type of power supply contained within the Head. Model Number & C22 has a 120 VAC power supply. Model Number & C25 has a 2///8 VDC power supply. The custom chip sota as a communication multiclexer that allows one flatil or flat-compatible device to communicate to escent of the tour RAL, ports on the faceptate. The cower supply provides all of the voltages necessary to power the Head and up to four Digital Relis. A power supply is housed in a holder accessible on the faceptate. See figure 2.1 and figure 2.2



Figure 2.1 Local (/O Head (120 VAC)

The INPUT connector is used for the Local (Or interface calle, L1 (htt) and L2 (neutral) are input power connections. GND is used to connect a ground whe to earth ground.



Figure 2.2 - Local I/O Head (24)48 VDC)

The INPUT connector is used for the Local (/C interface cable, (~) and (~) are input power connections. GND is used to connect a ground wire to earth ground

The aix LEDs on the faceblate are identical for ooth models. The LEDs indicate the following:

POWER	The 1 SVDC supply for the Rails is with n limital
-------	---

- COM There is communication on the cosal I/O Interface cable
- FA L FAULT 0 The Head and Rail 0 are not common dating. An I/O reset has shut off Rail putputs.
- FALL FAULT The Head and Rail 1 are not communicating. An I/O reset has shut off Rail putputs.
- FALLFAULT 2 The Head and Rail 2 are not communicating. An I/O reset has shut off Rail putputs.
- BALL FAULT & The Head and Beil & are not communicating. An I/O react has shut off Bail outputs.

3.0 INSTALLATION

This section describes how to install the Local VO Head.

DANGER

THE USER IS RESPONSIBLE FOR CONFORMING WITH THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE LOCAL CODES. WIRING PRACTICES. GROUNDING. DISCONNECTS, AND OVER-CURRENT PROTECTION ARE OF PARTICULAR IMPORTANCE. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SERIOUS BODILY INJURY OR LOSS OF LIFE.

WARNING

UNEXPECTED OUTPUT CHANGES MAY RESULT IF A RAIL IS PLUGGED INTO A LOCAL I/O HEAD THAT IS COMMUNICATING WITH A PROCESSOR OR REMOTE I/O HEAD. ANY HARDWARE CONFIGURATION CHANGES MUST BE MADE ONLY WITH THE LOCAL I/O INTERFACE CABLE (M/N 45C6) DISCONNECTED. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY INJURY.

3.1 Wiring

To neurce the possibility of electrical noise interfering with the properoperation of the control system, exercise care when installing the withig between the system and the external devices. For detailed recommendations refer to IEEE 518.

3.2 Installation

Use the following procedure to install each Local I/O Head. Cenerally, each Head is installed directly adove the fistle or fistle-compatible devices with which it will be connected, leaving at least 2 inches of clearance between the Head and the closest device. Multiple Heads should be installed side by side feaving at least 2 inches of clearance in between Heads.

- Step 1 Using the mounting battern in Appendix 8, crill rour holes of approximately .215 clamater. The Head is designed to be mounted vertically using ∉10 bolts or studa.
- Step 2 Mount the Head using one of the two methods illustrated in Appendix B.
- Step 3 Attach a retainer clip to the connector at each end of the Local I/O Interface cable (M/N 45C8). Note that the faceplate connectors have alots that correspond to the part of the retainer clip that protruces away from the cable connector. The retainer clip is used to ensure a tight connection between the cable and faceplate connectors.
- Step 4. Connect a Ball or Ball-compatible device to one of the hour BAIL ports on the Head using the I/O Ball cable (M/N 4505) that earne with the device. Continue with any remaining Balls. Instructions on mounting Balls and Ball-compatible devices are found in the Instruction menuals corresponding to the devices.

Step 5. Connect the Loca I/O Interface cable between the Local I/O Head connector tabeled INPUT and any Rail connector on the hardware with which the Head will communicate.

Note that you can aubatitute the I/O Hell caple (M/N 4505) for the Local I/O Interface cable (M/N 4508) in step 5 ecover You cannot, however, substitute the Local PO interface cable for the I/O Rail cable. If you do so the Rail will not operate.

- Step 8. Verify that power was disconnected from the wires that will be used to provide power to the Head.
- Stap 7. For M/N 61C22 connect 120 VAC and ground wring to the terminals on the Head Isceptate as follows.

Input	Terminal Label
120 VAC ho.	_1
120 VAG neutral	2
-	GND

Each screw tenning can accommodate no. 12 AWC wires. Minimum who size is 22 AWG.

0.5

For M/N 61C23, connect 24/48 VDC and ground wiring to the terminals on the Head faceptate as follows.

Input	Terminal Label
- 24/48 VDC	+
Common	Gam
	는 -

Each screw terminal can accommodate no. 12 AWG wires. Minimum wire size is 22 AWG.

Step 8. Check the installation for proper connections, safely covers, protective devices, and means of disconnection. Verily that the equipment is ready to apply power.

4.0 CONFIGURATION

Configuration is a method of describing how the system software and the VO are related. The process of configuring the Local VO Head is dependent upon the best. If the host is an AutoMate, use the AutoMate Programming Executive Software (M/N 450130 or M/N 450131) to perform the configuration. Note that the registers in which the configuration will be stored are dependent upon the register assignments of the particular model number.

If the Local I/O Head will be communicating through the DCS 5000/AutoMax Remote I/O Head with a DCS 5000 or AutoMax host use the appropriate Executive software to create the configuration that will include the registers/points accessed through the Tead. Use Executive software M/N 57C300-57C306 for DCS 5000 Processons and M/N 57C304 57C307, M/N 57C390 57C393, or M/N 57C395 57C397 for AutoMax Processons. See below for more specific information on configuring the Lead. Note that if the Local I/O Head will be connected to a rail that contains a M/N 45C42 Dust Bectronic Input module, that rail must be plugged into ports 1, 2, or 3 only.

4.1 Local I/O Head with AutoMate 20

Four registers are reserved for configuring the Local VC Head for use with an AutoMate 20. These registers and the configuration value to be written for each are listed below in a sample configuration for four Local VC Heads:

4 Local I/O Heads with AutoMate 20									
Register	Port#	i/O Type	Configuration Value	Rell# or Register					
2734	0	LHD	6400	0-3					
2735	2.	LHD	6404	4 7					
2736	2	LHD	6410	10-13					
2737	а	LID	6414	14.17					

4.2 Local I/O Head with AutoMate 30, AutoMate 40, or Local I/O Processor

When using the Local (IC Head with the AutoMate 30 or 40, or the Local (IC Processor, only the first register of the four that are needed for the configuration needs to be specified. The Executive software automatically assigns the next three configurations registers for the configuration. Note that even if only one port of the Head is being used, four configurations are still reserved to the configuration. See below for sample configurations.

Sample configuration with four fisits connected to the Local I/O Head and the Master 30 or 40 Processor in stol 1 :

MOLT	269°	TYPE	FSLOT	CARD	CHu	939	CH:	552	0-2	FEG.	4Hs	FEG
ł				AW	UHD	¢¢.	UH3	17	645	10-13	D	14-17

Sample configuration with four Rails connected to the Loost I/O Head and the Master Loost I/O Processor in etc. 2.

	1													1
	WSLT	3602	TYPE	FSLOT	(143)	CHC.	395	OH	857	5+2	FEG	сня	REG	
	7				1.02	(H):	0-T	143	1.7	-15	III	ΗD	14-17	
-	7													;
	ĺ.													
													23	Ì

Sample configuration with four Rails connected to the Local FO Head, the Local FO Processor in remote crop 7, a ot 4, and the Master Processor in stot 3.

	1												
	8944	00*	YP	1810	Gelda	1314	4.6	Ċ1	I C	6.7	IF C	ci a	19.5
	3	1	-118	<u>.</u>	10.	нр	94)	UH.3	47	142	10-13	b	14-17
	33												
1	7												1
	2												
	1												1

4.3 Local I/O Head with AutoMate Remote I/O Head

When using the Local (C. Head with the AutoMate Remote I/O Head, only the first register of the four that are needed for the configuration needs to be specified. The Executive software automatically assigns the next three configurations registers for the configuration. Note that even if only one can of the Head is being used, four configurations registers are still reserved for the configuration. See below for a sample configuration.

Sample configuration with Your Rails connected to the Local I/O Head, the Autol/ ate Remote I/O Head in drop 6, and the Remote I/O Processor (master) in stol 3 of the moster rack.

260°	TYPE	FSLO	0490	CH.	959	C-11	5E3.	0-2	FEG	<+*	FEO
*	RED.			011	6.4	103	1.7	141:	10-1*	-D	14. 7
	260° /	050° TYPE ¢ 8+0	DROP TYPE FELOT	DROP TYPE RELOT GARD	DROP TYPE RELOT GARD CH.	DROP TYPE RELOT CARD CH. 989 # CHD CHI CA	260° TYPE RELOT 0490 CHL 950 CH1 # EHD 0H2 C-2 DH2	260° TYPE RELOT GARD CHL REG CH1 REG # GHD DH3 C-3 DH3 4-7	260° TYPE RELOT GARD CHL REG CH1 REG CH2 # GHD (H1) C-7 (H1) 4-7 (H1)	260° TYPE FELOT 0480 CHL 880 CH1 863 CH2 FEG # 0FD 0H3 C42 DH1 447 (H1: 0611	2609 TYPE RELOT 0480 CHL 880 CH1 863 CH2 FEG (H3 # 0FD (H3 C4 0H) 447 (H1 0611 HD

4.4 Local I/O Head with DCS 5000/AutoMax Remote I/O Head

When using the Local (IC filead with the DCS 5000/AutoMax Remote I/O Head, the Local (IO Head) is configured in the configuration for the rack which contains the DCS 5000/AutoMax Remote (IO master models (M/N 57C410)). If you are using AutoMax Version 2.1 or earlier size below for the format of the statement used in the configuration task. If you are using AutoMax Version 3.0 or later, the Local (IO field is configured using the AutoMax Programming Executive

Note that you cannot mix input sho output modules in Balla connected to the Loost I/O Head when it is connected to a DCS 5000 AutoMax Remote I/O Head. You also cannot use the Analog Fial modules (M/N 61C350, 61C351, etc.) in this confiduration.

ndorn BIODEE name[MASTER_STOTem, DBOPec, STOTem, & REGISTER-r, Bit-b]

where:

- mmm Configuration task time number. This number may range from 1 to 32767.
- name Symbolic name of register or cit, ending with '% (integer) for registers or @ (booksin) for bits.

- Slot in rack containing DCS 5000/AutoMax master Remote I/O module. This number may range from 0 to 15.
- Drop number of DCS 5000/AutoMax Remote I/C Head.
 This number may range from 1 to 7.
- Communication port on the DCS a000/AutoMax Fernete 1/O Head to which the Local (/C Head is connected, This number may range from 0 to 3.
- Register number representing the Local I/O headcommunication port through which the register or bit will be accessed. This number may range from 0 to 3.
- Optional field defining the bit position within the register number. This number may range from 0 - 15.

5.0 DIAGNOSTICS AND TROUBLESHOOTING

DANGER

THE REMAINING STEPS ARE MADE WITH POWER ON. EXERCISE EXTREME CAUTION BECAUSE HAZARDOUS VOLTAGE EXISTS. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

> This section explains how to troubleehoot the Local I/O Head. Use the LEDs on the laceplate to determine the state of the Local I/O Head. If you cannot determine the problem from the instructions below as a guide, the unit is not user serviceable.

5.1 All LEDs on the Faceplate Are Off

Problem: All LEDs on the faceplate are off. This problem indicates, that the Hope is not rare ving 120VAC power within the specifical ranges, the fuse has blown, or that the Hoad is malfunctioning.

- Stap 1 Using a voltmeter, varify that the power source is 120VAC (for M/N 61C22) or 244/8 VDC (for M/N 61C23) and that 1 is functioning correctly
- Step 2 Step any application programs that are running and turn off power to the Local FO Head.
- Step 3 Inspect the fuse. 1 the fuse has blown, reclease it following the directions below. Otherwise, go on to step 4.

CAUTION

THE FUSE MUST BE REPLACED ONLY BY ANOTHER FUSE OF THE EXACT SAME. TYPE, AN AGC 4AMP FUSE. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN DAMAGE TO OR DESTRUCTION OF THE EQUIPMENT.

- e) Use a screwdriver to release the tuse holder located on the faceptate. Pull the fuse holder out of the Local VO Head.
- b) Take the old fuse due of the fuse holder and replace with the new fuse.
- c) Re-neert the fuse holder into the Loost 70 Head. Turn the screwdriver clockwise and press down on the fuse holder at the same time. The fuse holder must be flush against the faceplate.
- Step 1 Disconnect the Rail cables from the Head and turn on the power to the Head. If the LEDs are lit, there is a power supply short in one of the Rails of Rail cables. Replace one item (Rail of Rail cable) at sittine until the problem re-appears.

5.2 The COM LED is Off

Problem: The COM LED on the faceptate is off, When III, this LED algorithms that there is communication between the Local FO Heet and the processor or Remote I/O Head to which it is connected. It should be on if communication is taking place. The possible causes of this problem are incorrect configuration, a disconnected or institutioning Local /O interface cable, a malfunctioning processor or Remote FO Head, a rail taultion a malfunctioning Local /O Head. Follow the steps below to isolate the problem.

- Step 1. Verify that the configuration of the Local VO Head is correct and that no errors have been logged in the error registers. Refer to eaction 4.0 for more information on configuration. Refer to 4-5120 or 4-3150 for more information about error registers in the AutoMate 20 stor AutoMate 30 or 40 processors, respectively.
- Step 2. Step any application programs that are running
- Step 3. If a RAIL FAULT LED on the Local VO Head is on, troubleshoot the indicated Fial.
- Step 4. Examine the processor or Remote 1:0 Head to which the Local I/O Head is connected. If the LED incidating power is off, check the power being supplied to the unit. If power is sufficient and the LED is off, replace the processor or Remote UD Head.
- Step 5. Verily that the connections on both erics of the Local I/O Interface cable are tight.
- Step 6. Um off power to the Loce, EC Head and the processor or Remote I/O Head. Remove the Local /O Interface cable. Verily that there are no bent pins on the cable connectors or EO ports.
- Step 7. Bop ace the Local (0 Interface cable, if the problem is still not corrected, replace the Local VO Hose.

5.3 RAIL FAULT LEDs Are On

Problem: One prial of the HAL FAULT LF is are on sho original from the corresponding Hals are off. The possible causes of this problem are a disconnected or mailunctioning. /O Rail cable, a mailunctioning Hall, one mailunctioning Local I/O Heed.

In DCS 5000/AutoMax systems, a rail fault of the Local (/C Head (M/N 61C22A or 61C23) will be indicated in register 4 (crop status) of the M/N 57C416 Remote I/O Communications module. For earlier versions of the Local (/O Head (61C22 or 45C22) the RAIL F/ULT LEDs note to be used to diagnose rail faults as described below.

- Step 1. Step any application tasks that are running and turn of power to the Local I/O Head.
- Step 2. Try to clear the condition by disconnecting and then re-connecting the I/O Hall cable(a) and the Local I/O Interface cable. Make certain the connectionalare tight. Verify that the cables are the correct cables, i.e., M/N 46(35 between the Head and the boat.

- Step 0. Turn on power to the Local I/O Head and put the application program(s) into run. I any RAIL FAULT LEDs turn on, stop application tasks and turn off power to the Local I/O Head.
- Step 4. I toubleshort the Hall(s). If the problem is still not corrected, replace the Local (C Head)

Appendix A

Technical Specifications M/N 61C22

Ambient Conditions

- Storage temperature: -201 -851C
- Ocerating temperature, 0° 60° C
- Humidity: a-80% non-condensing

Maximum Power Dissipation

50 Walts with 64 MO installed

Dimensiona

- leight 3.5" 8.9 cm
- Wioth: 3.5" 14.0 cm
- Depth: 6.7* 17.0 cm
- Weight 3.6 lbs 1.1 kg

Electrical Characteristics

- System power requirements: 120 VAC 102 132 VAC acceptable range
- Cycle loss: 3 cycles (60 Hz from low line)
- Line Fequency: 47.5 to 63 Hz
- Transient vo tages (meximum of 2 cyclos): 84 138 VAC
- Maximum, dad at 120 VAC: .5 Amps.
- Fuse: AGC 4Amp 250 V fime-delay
- Output power for Bails: -5 VDC

Appendix A (Continued) M/N 61C23

Ambient Conditions

- Storage temperature: -20* -85°C
- Operating temperature: 01 601C.
- Humidity: 5 90% non-condensing

Maximum Power Dissipation

50 Walts with 6/ I/O installed

Dimensions

- Height 3.5 1 8.9 cm
- Work 5.51 14.0 cm
- Beptit: 6.7*
 17.0 cm
- Weight 2.5 lbs 1.1 kg

Electrical Characteristics

- System power requirements: 24/48 VDC, 20-65 VDC acceptable range.
- Maximum, and at 24 VDC: 6 Amps.
- Fuse: AGC 34mp 850 V time-dolay
- Output power for Bails: ~5 VOC

Appendix B

Local I/O Head Mounting Pattern



Appendix B

(Continued)



For additional information

1 Allen-Bradley Drive Mayfield Heights, Ohio 44124 USA Tel: (800) 241-2886 or (440) 646-3599 http://www.reliance.com/automax

www.cockwellankanation.com

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