
KOLLMORGEN S/CD Drive

Application Note

This document describes how to configure a Paradigm operator interface terminal to allow communications with a Kollmorgen S/CD Drive. The communications protocol supports access to pertinent parameters. Please read this document carefully before attempting to configure communications with these devices.

Introduction

The EDICT-97 configuration software has been designed to allow the user to enter a command mnemonic and number in a manner that should be familiar to the user of a Kollmorgen S/CD Drive. The driver allows the exchange of data with the Drive.

Accessing Data

The Kollmorgen S/CD Drive communications protocol allows access to a number of parameters over a serial communications link. The driver described here supports the parameters in the table below. It is important that the programmer use the S/CD manual to limit the numerical values written to many of the parameters to the range supported by the version of S/CD being used. For example, ANOUT will accept values 0-3, 5, 8, and 9 in version 2.1. An older version did not support 9. So the programmer must structure this setting to avoid 4, 6, 10 and above, and perhaps 9.

Commands MA and MI

Commands MA (Serial Move Absolute) and MI (Serial Move Incremental) require a position and a velocity parameter. For that reason, two other parameters, MAV and MIV were created to permit both items to be sent with the move command. The MAV(MIV) should be loaded with the desired velocity value. Then, the desired position can be written to the MA(MI) command.

READ ONLY Parameters

ADDR	Drive Address
ANIN	Analog Input
DICONT	Continuous Rated Current
DIP	DIP Switch Setting
DIPEAK	Drive Peak Rated Current
ENCINITST	Encoder Initializaton
ERR	Last Error
HALLS	Hall Switch Values
I	Motor Current
IA	A Phase Current
IC	C Phase Current
ICMD	Current (Torque) Cmnd
IMAX	Maximum Current
IN	State of the Three Digital Inputs
INDEXPOS	Position of Marker Signal
INPOS	PFB within following error of PCMD
MFOLD	Motor Foldback Status
PE	Position Following Error
PFB	Cumulative Position Feedback
PRD	Absolute Position Feedback
RDRES	Resolver Resolution
STAT	Status Summary
STOPPED	Move Complete
TRUN	Run Time Counter
V	Velocity

VCMD	Velocity Command
VE	Velocity Error
VEXT	Instantaneous Velocity Feedback
VMAX	Max. System Velocity

READ ONLY FLAGS

ACTIVE	Ready to Operate
CCWLIM	CCW Limit is Reached
CWLIM	CW Limit is Reached
DIPEN	Dip Switch Enable State
DRIVEOK	Drive Fault State
FOLD	Foldback Circuit State
READY	Software Enable State
RELAY	Fault Relay State
REMOTE	Hardware Enable State
SWEN	Serial Port Enable State
THERM	Thermostat State

READ/WRITE FLAGS with values 0 or 1

ACONFIG	Auto Config Enable/Disable
ACTFAULT	Fault Response
COMPFLT	En/Dis Low Pass Vel. Loop Filter
DIR	Direction of + Rotation
GEAR	En/Dis. Electronic Gearing
HOLD	Position Hold Mode
LIMDIS	Travel Limit En/Dis
MFOLDDIS	En/Dis. Foldback Function
MHINVA	Invert Hall Switch A
MHINVB	Invert Hall Switch B
MHINVC	Invert Hall Switch C
O1	R/W Output on C3-12
PCMDMODE	Analog/Normal Pos. Mode Select
PSCALE	Pos. Scale Factor for Analog Output
RELAYMODE	Drive Up/Ready Relay
THERMTYPE	Neg./Pos. Temperature Sensor Type
UNITS	Internal/Physical Units Used
UVRECOVER	Undervoltage Fault Recovery
XENCDIR	Ext. Encoder + Rotation Direction
ZERO	Zero Mode Enable/Disable

READ/WRITE FLAGS that are not just 0 or 1

ANDG	Dual Gain Algorithm Setting
ANOUT	Analog Output Source Select
DUALFB	En/Dis. External Feedback
FILTMODE	Velocity Filter Mode
FOLDMODE	Foldback Mode
GEARMODE	Electronic Gearing Operating Mode
ILSBMODE	Interpolate LSB Mode
MENCTYPE	Motor Encoder Type

MFBDIR	Motor Feedback Direction
MOTORTYPE	Linear/Rotary Motor Select
MSINFRQ	Sine Encoder Max Freq
O1MODE	Output 1 Function
O1RST	Reset Level for O1MODE
O1TRIG	Trip Level for O1MODE
PLIM	Software Position Limit Control
PROFMODE	ACC/DEC Profile Mode
STOPMODE	Dynamic Braking Mode
THERMODE	Thermostat Open Operation
UVMODE	Undervoltage Fault Mode

COMMANDS - WRITE 1 To Value

ANZERO	Zero Analog Offset
CLREEPROM	Clears the EEPROM
CONFIG	Configure I Control Loops
DIS	Disable Drive
EN	Enable Drive
ENCINIT	Encoder Initialize
ENCSTART	Encoder Initialize
FLTCLR	Clear Fault History
K	Disable Drive
REFRESH	Tuning Refresh
RSTVAR	Reset Variables
S	Stop Motor
SAVE	Save to EEPROM
STOP	Stop Drive (OPMODE 0)
TESTLED	Test LED Mode

COMMANDS - Long Delay before Response Received

LOAD	Load from EEPROM
SAVE	Save to EEPROM

JOG COMMANDS - Enter value for JSpeed and JTime before initiating J

JSpeed	Speed for Jog Command (Required)
JTime	Time for Jog Command (Optional)
J	Jog (JSpeed required, JTime Optional)

READ/WRITE PARAMETERS

ACC	Acceleration
ANDB	Analog Dead Band
ANLPFHZ	Analog Input Filter Rate
ANOFF	Analog Offset
AUTOHOME	Homing Behavior on Power Up
AVGTIME	Averaging Time Period
BW	Velocity Bandwidth
COMPMODE	Velocity Controller Type
DEC	Deceleration
DECSTOP	Deceleration Fast Stop

DISSPEED	Active Disable Speed Window
DISTIME	Active Disable Delay Time
ENCOUT	Encoder Out Resolution
ENCOUTO	Scale Down for Encoder Output Channel
GEARI	# of Teeth on Input Electronic Gear
GEARO	# of Teeth on Output Electronic Gear
GP	Position Loop-Proportional Gain
GPAFR	Pos. Loop-Feed Fwd. Accel Gain (I)
GPAFR2	Pos. Loop-Feed Fwd. Accel Gain (V)
GPD	Pos. Loop-Derivative Gain
GPI	Pos. Loop-Integral Gain
GPISATIN	Pos. Loop-Integral Saturation Limit
GPISATOUT	Pos. Loop-Integral Saturation Limit
GPVFR	Pos. Loop-Feed Fwd. Velocity Gain
GV	Proportional Gain
GVI	Integral Gain
HOMESPD	Homing Speed and Direction
HOMESTATE	Homing Function Status
HOMETYPE	Type of Homing Function
HWPOS	Hardware Counter Feedback Position
ICONT	Continuous Current
IENCSTART	B-C Phase Current for ENCSTART
IFRIC	I Loop-Coulomb Friction Constant
IGRAV	I Loop-Gravity Constant
ILIM	Application Current Limit
ILIM2	Current Limit for INxMODE 8
ISCALE	ANIN Current Scale Factor
ISTOP	Braking Function Current Command
IZERO	C-B Phase Current
KV	Prop. Gain Tuning Variable
KVFR	Feed Forward/Back Ratio
KVI	Int. Gain Tuning Variable
LMJR	Load/Motor M.O.I.
LPFHZ1	L.P.F. Low Cutoff 1
LPFHZ2	L.P.F. Low Cutoff 2
MA	Serial Move - Absolute
MAPOS	Absolute Position for INxMODE 13
MASPEED	Move Speed for INxMODE 13
MAV	Serial Move Absolute - Velocity
MBEMF	Back EMF
MBEMFCOMP	Back EMF Compensation %
MDIST0	Input Triggered Index Distance
MDIST1	Input Triggered Index Distance
MDIST2	Input Triggered Index Distance
MDIST3	Input Triggered Index Distance
MENCOFF	Motor Encoder Index Pos.
MENCRES	Motor Encoder Resolution
MFOLDD	Motor Foldback Delay Time
MFOLDR	Foldback Recovery Time
MFOLDT	Folback Time Constant
MI	Serial Move Incremental
MICONT	Continuous Rated Current
MIPEAK	Peak Rated Current
MISPEED0	Input Triggered Index Speed

MISPEED1	Input Triggered Index Speed
MISPEED2	Input Triggered Index Speed
MISPEED3	Input Triggered Index Speed
MIV	Serial Move Incremental - Velocity
MJ	Rotor Inertia or Coil Mass
MLGAINC	Adaptive Gain-Continuous
MLGAINP	Adaptive Gain-Peak
MLGAINZ	Adaptive Gain-Zero
MLMAX	Maximum Inductance
MLMIN	Minimum Inductance
MPHASE	Resolver/Encoder Phase
MPITCH	Linear Motor Pole Pitch
MPOLES	# of Motor Poles
MRESPOLES	# of Feedback Poles
MSININT	Sine Encoder Interpolation Level
MSPEED	Max Recommended Velocity
MTANGLC	Torque Angle Adv. @ Icont
MTANGLP	Torque Angle Adv. @ Ipeak
MVANGLF	Vel. Angle Adv. @ MSPEED
MVANGLH	Vel. Angle Adv. @ MSPEED/2
NOTCHBW	Vel. Loop-Notch Filter Bandwidth
NOTCHHZ	Vel. Loop-Notch Filter Center Freq.
OPMODE	Drive Operational Mode
PCMD	Position Command
PEINPOS	Threshold PE for INPOS Flag
PEMAX	Max. Allowable Position Error
PEXT	Ext. Encoder-Accumulated Position
PEXTOFF	Ext. Encoder-Position Offset
PFBOFF	Int. Position Counter Offset
PMAX	Max. Allowable Motor Shaft Position
PMIN	Min. Allowable Motor Shaft Position
PROFSCRV	S Curve Acceleration Time
SININTOUT	Sine Enc. Interpolation Factor
T	Set Commanded Current (OPMODE 2)
TF	Damping Factor
THERMTIME	Over-Temperature Fault Delay
UVTIME	Undervoltage Fault Latch Delay
VBUS	Drive Bus Voltage
VLIM	Application Velocity Limit
VOSPD	Over-Speed Trip Limit
VOSPDENS	Sensitivity Parameter
VSCALE	ANIN Velocity Scale Factor
XENCRES	Ext. Encoder Resolution
ZPOS	Move Encoder Marker relative to Motor Shaft

Knowledge of Unit Operation Is Assumed

In all cases, the simple principle of 'pass-through' is maintained: there is no attempt to validate a value in terms of the end use of the unit: both familiarity with the Drive functions and knowledge of system operation are assumed.

Communications**RS232 Connection**

Paradigm RS232 Port	Kollmorgen S/CD
Pin 1 (Tx)	2
Pin 2 (Rx)	3
Pin 3 (RTS)	
Pin 4 (CTS)	
Pin 5 (Comm.)	5

In addition a link must be fitted between Pin 3 (RTS) and Pin 4 (CTS) on the Paradigm.

RS485 Connection

Paradigm RS485 Port	Kollmorgen S/CD
Pin 6 (TxA)	8
Pin 7 (TxB)	9
Pin 8 (RxA)	6
Pin 9 (RxB)	7
Pin 10 (Comm.)	5

In addition, connect a 1K resistor between 9 and 10 of the Paradigm.