

Intelligent Actuator Robocylinder/E-Con

Information Sheet for Crimson v2.0

Compatible Devices

- Intelligent Actuator Robocylinder/E-Con (RCP, RCP2, or RCS)

Verified Device

- RCP2-CG

Axis Selection – A drop-down list allows the programmer to select a desired axis (Drop) in the properties for each device.

Accessible Data

PREFIX	ROBOCYLINDER FUNCTION	Explanation
MEM	Read/Write Memory (R4, RM, WM)	Note 5
S	Status Inquiry (n)	Read Status as one value
STS	Status	Note 1
ALM	Alarms	Note 1
INP	Input Status	Note 1
OUT	Output Status	Note 1
A	Absolute Move (a)	Move to position 'data'
C	Absolute Move mm (c)	Move to 'data' mm, Note 3
D	Stop Motion (d)	Stop/Cancel Motion
E	Increment Move mm (m)	Move 'data' units, Note 3
FVE	Velocity Data mm	Note 2, Note 3
FAC	Acceleration Data mm	Note 2, Note 3
F	Send FVE/FAC mm (f)	Send Vel./Acc. mm, Note 3
I	Position Band Change (i)	Band Width = 'data'
K	Decelerate And Stop (k)	Ramp Stop, Note 3
M	Increment Move (m)	Move 'data' units
O	Home to 'HP' (o)	Note 4
HP	Home position (0 -> Motor/Forward)	Note 4
Q	Servo On/Off (q)	Note 7

Q3	Position Move (Q3)	See Appendix
R	Alarm Reset (r)	Send Alarm Reset Command
VVE	Velocity Data	Note 2
VAC	Acceleration Data	Note 2
V	Send VVE/VAC (v)	Send VVE/VAC
Q1	Set A->B Point (Q1)	See Appendix
T	Send Address Allocation (T4)	See Appendix
T4R	Address Allocation Response	See Appendix
W	Send Data (W4)	See Appendix
W4R	Data Write Response	See Appendix
V5	Set B->A Point (V5)	See Appendix
V5R	B->A Response	See Appendix
XQ1	A->B Position Number	See Appendix
XT4	Address Allocation	See Appendix
XW4	Data Write	See Appendix
XV5	B->A Position Number	See Appendix
X	EXECUTE Point Write (Q1-T4-W4-V5)	See Appendix
XOK	Point Write Status	See Appendix

General Information

When first connecting to a device, the driver determines whether a Model RCP, RCP2, or RCS, is assigned on the designated axis. Therefore, it can automatically reject sending certain commands to an RCP. See notes 7 and 9.

Actual command letter is shown in ()'s.

'data' indicates that a meaningful value is to be written.

For commands D, F, K, R, V, and X, the data written is irrelevant. These selections will return hex FFFFFFFF (decimal -1) when read. Additionally, commands that are write only, such as Absolute Move, which transmit data but do not read data, will return -1 also. It is recommended that these be set for Write Only for more efficient data transfer.

Any write to T4R, W4R, V5R, or XOK, will set its value to 0.

Some models and some commands define Velocity, Acceleration, and Position, in mm. Others define them in pulses. The programmer may need to compute pulses/engineering unit, or convert between engineering units, in order to handle the data properly. In that case, scale the data using the device specifications. Additionally, the HOME direction specified by the device's user parameter 5 will determine the sign of the data for a given direction of motion.

NOTES

1 – These items are extracted from the status returned by numerous commands.

2 – ‘data’ written to FVE, FAC, VVE, or VAC is maintained internally. When the F or V command is executed, the saved numbers are the values that will be used to set the Velocity and Acceleration.

3 – THESE INSTRUCTIONS ARE NOT SUPPORTED IN RCP. Reads return 0, Writes return without indication.

4 – HOMING

Execute HOMING to Motor End for RCP, RCP2, (RCS)

(O) HOME Variable	HP Variable	Notes	
Read/Write	Home = 0	0	On Read, Home = -1
Write Only	Home ^ = 1	0	On Startup: Set Home = 0
Read/Write	Home = 7 (9)	N/A	On Read, Home = -1

Execute HOMING away from Motor End for RCP, RCP2, (RCS)

(O) HOME Variable	HP Variable	Notes	
Read/Write	Home = 0	1	On Read, Home = -1
Write Only	Home ^ = 1	1	On Startup: Set Home = 0
Read/Write	Home = 8 (10)	N/A	On Read, Home = -1

5 – Use the MEM command to read and write specified memory locations. The programmer selects the target address when configuring this item. For example, 7400 is the value to read the current position. The driver DOES NOT VALIDATE the address selected. The programmer is responsible for ensuring that writes are performed only to permissible addresses. Also see Note 6.

6 – When a memory write uses MEM, the driver automatically issues the T command (using the configured address) to set the address, before executing the write.

The W command for writing memory MUST be preceded by the execution of a T command, in order to set the proper address.

7 – Changing the Servo value to a different ODD number will send a command to turn the servo ON. Changing the Servo value to a different EVEN number will send a command to turn the servo OFF.

APPENDIX – Using Point selections to configure Points

Two different ways of writing point data are provided, Step-by-Step, and Block. Write the desired point number to Q3 to execute the move to that point.

Step-by-Step Point Writes – Execute Immediate Write

Q1 – If necessary, move the data in non-volatile memory to the edit area. The programmer writes the desired point number (1-F) to Q1. This allows the current parameters of the point to be viewed in MEM400, MEM404, MEM405, and MEM407.

T4 – Set the address for the item to be written.

Description	Hex Address	Decimal Address
Position	0x400	1024
Velocity	0x404	1028
Acceleration	0x405	1029
Moving Current Limit	0x407	1031

Echo of the address will appear in selection T4R.

W4 – Write the desired value for the item into this selection. Position data is 2's complement. The response in W4R is the T4 address + 1.

V5 – Write the point number where the data is to be saved. The response in V5R is the total number of writes to non-volatile memory made to date.

Block Writes – Store, then write when Command X is executed.

The selections XQ1, XT4, XW4, and XV5, are assigned just as Q1 to V5 above. The data is stored in the driver until the X command is executed. The data XQ1-XT4-XW4-XV5 is transferred in that sequence.

The responses are viewed in T4R, W4R, and V5R, as above. Should the sequence be interrupted, XOK will assume the value:

XOK Value	Description
1	No Response to Command Q1
2	No Response to Command T4
3	No Response to Command W4
4	No Response to Command V5

XOK = 0 indicates the command completed successfully.

Example – Step-by-Step Point Configuration

Program – InitializePointTable

```
VarT4 = 0x400; // Address of Position
VarW4 = -1000; // 1000 units from motor end (Home = motor end)
VarT4 = 0x404; // Address of Velocity
VarW4 = 1000 // Desired Speed
VarT4 = 0x405; // Address of Acceleration
VarW4 = 100; // Desired Acceleration
VarV5 = 1; // Store to point 1 in non-volatile memory
```

```
VarT4 = 0x400; // Address of Position
VarW4 = -3000; // 3000 units from motor end (Home = motor end)
VarT4 = 0x404; // Address of Velocity
VarW4 = 800 // Desired Speed
VarT4 = 0x405; // Address of Acceleration
VarW4 = 150; // Desired Acceleration
VarV5 = 2; // Store to point 2 in non-volatile memory
// continue as necessary
```

Entering 1 into VarQ3 will move the motor to 1000 units from motor end, with velocity 1000, acceleration 100.

Entering 2 into VarQ3 will move the motor to 3000 units from motor end, with velocity 800, acceleration 150.

Edit one Point Parameter via Block Write:

Set VarXT4 to 0x400, 0x404, 0x405, or 0x407, depending upon which parameter is to be changed.

Set VarXW4 to the new value.

Set VarXV5 to the destination point number.

Write to VarX.

Cable Information

Table C1:

RS232 Connection

G3 RS232 Port	IAI Robocylinder
5 (Tx)	2 (Rx)
2 (Rx)	3 (Tx)
3/4 (Comm.)	5 (Comm.)

Table C2:

RS485 Connection on 8-pin Mini-DIN

G3 RS485 Port	RS485 Mini-DIN
1 (TxB)	1
2 (TxA)	2
3 (RxA)	2
4(RxB)	1

* Note that other signals on this connector may be required to interface with the device controlled by the RCP2-CG. See RCP2 documentation for details. Table C2 reflects only the minimum G3 connection required.