

DYNAMIC MOUNTS INTERNATIONAL

DynaStick User Manual - Software version BB



IMAGE FOR ILLUSTRATION PURPOSES ONLY
AND MAY VARY DEPENDING ON MODEL

- LINEAR SLIDE OR ROTARY MOTOR CONTROL
 - INTELLIGENT END STOP INPUT
 - HIGHLY ACCURATE POSITIONING
 - ADJUSTABLE RAMPING
- THUMBWHEEL AND POT SPEED CONTROL
- EXTERNAL INPUT FOR FOOT PEDALS ETC
 - MONITOR ROLL SLAVE OPTION*
- SHOTBOX FUNCTION (4 MEMORIES) OPTION
 - BRUSHED OR BLDC (UP TO 40V 30A**)

*ON REQUEST **MODEL / MOTOR DEPENDENT

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CONTROLS & INDICATORS

PRE-SET GEAR RING

ROTATE TO SET DRIVE SPEED 0-9 (**PLUS** IS ONE DIRECTION, **MINUS** IS REVERSE).

RAMP FUNCTIONS ARE "SCALED" BY THE GEAR SETTING SO TIME OF DECAY IS SIMILAR FOR SPEED 1 OR SPEED 9.

SWITCH IN LOCK/MID POSITION:

CENTRE BUTTON STARTS & STOPS LOOP MODE
UP/DOWN SELECT MOVES TO BE LOOPED
RIGHT = START LOOP
RING = NUMBER OF LOOPS (0-9, CONTINUOUS)

END STOPS (UP BUTTON ARROWED)

UP - SET STOP 1
UP - SET STOP 2
DOWN - CLEAR END STOPS
 (REQUIRES 2 PRESSES TO CLEAR)

CENTRE BUTTON TOGGLES BETWEEN SCREENS (GRAPH - NUMERICAL - STEP/DECEL - POSITION STORE - IN/EXT JOYSTICK) WHEN SWITCH IS IN **RUN** POSITION.

SHOTBOX MEMORY*

ALL 4 QUADRANT BUTTONS USED TO DRIVE TO SHOTBOX MEMORY POSITIONS (IF MODE SWITCH = LOCK) OR SAVE SHOTBOX POSITIONS (MODE SWITCH = RUN & IN "STORE POSITION" SCREEN DISPLAYED)

JOYSTICK SPEED INDICATOR

LEDS WILL ROTATE DEPENDING ON MOTOR DRIVE OUTPUT. DIM OR STATIONARY SHOWS NO REQUIRED. BRIGHT / ROTATING = MOTION IN PROGRESS.

COMMS (RS-485)

PROGRAM / EXTERNAL JOYSTICK

MODE SWITCH:

UP = **OFF**
 MID = **DIAL LOCKED** - ONLY SHOTBOX RECALL/LOOP BUTTONS OPERATE
 DOWN = **RUN** - ALL ACTIVE (SHOWN)

JOYSTICK SPEED CONTROL

GREEN: RUN : DIAL ON - ALL BUTTONS ACTIVE / MOVE STORE
RED : RUN : DIAL LOCKED - MOVE PLAYBACK (USING ARROWS)
OFF: SYSTEM LOCKED

ENDSTOPS LED:

OFF = USER ENDSTOPS NOT SET (ES -- DISPLAYED ON LCD)
GREEN = USER ENDSTOPS SET, BUT NOT REACHED (ES <> DISPLAYED ON LCD)
FLASHING = END STOPS REACHED (RED or RED/GREEN)
 LCD DISPLAYS << OR >>. INBUILT MAGNETIC ENDSTOPS ARE DISPLAYED BY |< OR >|

JOYSTICK DIRECTION LED

DATA COMMS LED

5V ANALOGUE POWER LED

5V DIGITAL POWER LED

EXTERNAL POWER LED

IMAGE FOR ILLUSTRATION PURPOSES ONLY

NOTCH

SPEED POT

CANON LP-E17 BATTERY (OPTIONAL - REQUIRED FOR RF) SHOWING DIRECTION OF INSERTION

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CONTROLS & INDICATORS (cont.)



IMAGE FOR ILLUSTRATION PURPOSES ONLY

LCD				
JS	SP	POT	Vs / Vm	ES
<p>+/- PERCENTAGE OF SIGNAL FROM THUMB CONTROL</p> <p>"JS" DISPLAYED WHEN INTERNAL JOYSTICK SELECTED</p> <p>"EXT" DISPLAYED WHEN EXTERNAL JOYSTICK / FOOT PEDALS SELECTED.</p>	<p>MASTER MAXIMUM SPEED SETTING (+/-0-9)</p> <p>MOTOR DIRECTION WILL DEPEND ON POSITIVE OR NEGATIVE SPEED. "0" WILL LOCK MOTOR. SPEED IS ADJUSTED BY TURNING NAVIGATION WHEEL RING (ORANGE DOTTED CIRCLE).</p>	<p>PERCENTAGE VALE OF OVERALL SPEED CONTROL POT.</p> <p>THIS SETTING IS SUMMED TO THE JOYSTICK VALUE.</p>	<p>Vs DISPLAYS STICK BATTERY VOLTAGE (84 = 8,4 VOLTS) IF PRESENT.</p> <p>Vm DISPLAYS DRIVE VOLTAGE (IN WHOLE VOLTS)</p> <p>THIS DISPLAY TOGGLES BETWEEN Vs & Vm IF STICK BATTERY IS PRESENT, ELSE JUST Vm IS DISPLAYED.</p>	<p>END STOP DISPLAY</p> <p>-- NO USER STOPS SET</p> <p><- 1 USER STOP SET</p> <p><> BOTH USER STOPS SET</p> <p><< 1 END REACHED (LED 2 FLASHES RED/GREEN)</p> <p>>> OTHER END REACHED (LED 2 FLASHES RED)</p> <p>[< or >] DISPLAYED AT HARD LIMITS (AUTOMATICALLY PICKED UP - CAN ONLY BE CLEARED WITH POWER RESET).</p>
<p>NAVIGATION WHEEL</p> <p>NOTES: ORANGE DOTTED LINE IS SPEED MASTER SETTING CHANGE CONTROL (+/- 0-9) THE THUMB SPEED CONTROL & SPEED CONTROL POT ARE GOVERNED BY THIS SETTING</p>				
^	>	V	<	C
<p>MOTION GRAPH (MAIN SCREEN)</p> <p>NOTES: SWITCHES TO BARGRAPHS UPON MOTION OR THUMB CONTROL INPUT S; STICK SPEED DEMAND M: ACTUAL MOTOR SPEED (LOG)</p>				
END STOP SET	NO FUNCTION	END STOP CLEAR (PROMPTED)	NO FUNCTION	NEXT DISPLAY (TO 2)
<p>PARAMETERS (SCREEN 2)</p> <p>NOTES: DISPLAYED WHEN THERE IS NO MOTION INTENDED AN ASTERISK APPEARS AFTER THE "JS" TO INDICATE SCREEN 2</p>				
END STOP SET	NO FUNCTION	END STOP CLEAR (PROMPTED)	NO FUNCTION	NEXT DISPLAY (TO 3)
<p>MOTION ADJUST (SCREEN 3)</p> <p>NOTES: DECEL / STEP = 1 TO 20</p>				
DECEL +	STEP +	DECEL -	STEP -	NEXT DISPLAY (TO 4)
INCREASES THE END STOP RATE OF DECELERATION	INCREASES THE GENERAL SPEED RATE OF CHANGE	DECREASES THE END STOP RATE OF DECELERATION	DECREASES THE GENERAL SPEED RATE OF CHANGE	
<p>POSITION STORE (SCREEN 4)</p> <p>NOTES: WILL STORE MOTOR POSITION WHETHER OR NOT MOTION IS IN PROGRESS MOVE SWITCH TO "LOCK" TO INSTANTLY GOT TO POSITION REPLAY JOYSTICK STILL ACTIVE. "GOTO" SPEEDS DEPENDENT UPON SPEED & STEP/DECEL SETTINGS.</p>				
STORE CURRENT MOTOR POSITION TO MEMORY 2	STORE CURRENT MOTOR POSITION TO MEMORY 2	STORE CURRENT MOTOR POSITION TO MEMORY 2	STORE CURRENT MOTOR POSITION TO MEMORY 2	NEXT DISPLAY (TO 1)
<p>INPUT SELECT (SCREEN 5)</p> <p>SELECTS THUMB SPEED CONTROL (LCD SHOWS "JS") SELECTS EXTERNAL JOYSTICK / FOOT PEDALS (LCD SHOWS "EXT")</p>				

MOTION GRAPH DISPLAY:



THIS SCREEN WILL BE DISPLAYED AUTOMATICALLY IF ANY MOTION IS OCCURRING, OR DEMANDED (UNLESS IN A SET-UP SCREEN OR PLAYBACK SCREEN).

LINE 1 WILL SHOW "P" (POSITION) AND DISPLAYS POSITION BETWEEN THE USER ENDSTOPS (IF SET) OR HARD STOPS (ONCE BOTH HAVE BEEN REACHED).

LINE 2 WILL DISPLAY "S" FOLLOWED BY SPEED DEMANDED BY THE JOYSTICK, AND "M" FOLLOWED BY A MOTOR SPEED BAR GRAPH. THE BLUE RING OF LEDS AROUND THE NAV WHEEL WILL REFLECT THIS GRAPH.

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OPERATIONS

SWITCH SETTINGS	OFF	LOCK / SHOTBOX	RUN
	Top LED is OFF	Top LED is RED	Top LED is GREEN
	SWITCHES HAND CONTROL INTO "SLEEP"	NAVIGATION WHEEL RECALLS MOVES	ALL BUTTONS ARE ACTIVE
	TURNS OFF ALL COMMUNICATIONS - DRIVE WILL SWITCH OFF	MASTER SPEED & END STOPS CANNOT BE CHANGED	UP button sets user end stops DOWN button (2 presses) clears them (after prompt)
	END STOP, SHOTBOX ETC SETTINGS WILL BE REMEMBERED	THUMB SPEED CONTROL & SPEED POT OPERATE AS NORMAL.	In "STORE" screen, UP / DOWN / LEFT / RIGHT buttons are used to store the CURRENT position of the motor.
	IF BOTH END STOPS ARE SET, THEY WILL BE KEPT	SHOT BOX PLAYBACK BUTTONS ACTIVE (UP / DOWN / LEFT / RIGHT)	CENTRE button changes display screens: 1: Normal graphing screen 2: Parameters screen 3: Motion Adjust: Joystick and Decel ramps 4: Move store
	IF ONLY 1 END STOP IS SET, IT WILL BE DELETED	CENTRE BUTTON IS "LOOP MODE" - Playback (0-9 or continuously using nav wheel) positions 1-2, 1-3, or 1-4. Knob controls delay time (2-59 seconds, 1-40 minutes)	Wheel changes overall speed setting - ramp time in speed 1 should be similar to ramp time to speed 9. +/- reverses joystick
	IF THE MOTOR IS IN A FAULT STATE, SWITCHING THE STICK TO SLEEP, THEN BACK TO LOCK OR RUN SHOULD CLEAR THE FAULT.	When in LOOP mode, centre button (or moving switch to OFF or RUN) exits.	
	MEMORY STORE: MAXIMUM SPEED SETTING, END STOP DECELERATION AND STEP SETTINGS ARE SAVED TO MEMORY.		

STICK LEDS	1	2	3	4	5	6	7
	OFF - STICK IN "SLEEP" (SWITCH SET TO SLEEP)	OFF - NO END STOPS SET	OFF - NO DEMAND (WITHIN DEADBAND VALUE) FROM THUMB SPEED CONTROL - NO MOTION	OFF - STICK IN "SLEEP"	GREEN - DIGITAL 5V POWER OK	GREEN - ANALOGUE 5V POWER OK	GREEN - EXTERNAL VOLTAGE INPUT
	RED - STICK IN "LOCK" (SWITCH SET TO LOCK) NAVIGATION WHEEL INACTIVE - NO CHANGING OF MASTER SPEEDS, SETTING/CLEARING OF END STOPS, CHANGING MOTION PARAMETERS OR SCREEN DISPLAYS POSSIBLE	GREEN - END STOPS SET, BUT NOT TRIGGERED	GREEN - SPEED DEMAND ABOVE DEADBAND VALUE	FLASHING BLUE - DATA COMMUNICATIONS ACTIVE (DOES NOT IMPLY DATA IS SUCCESSFUL - USE DISPLAY OF Vm, END STOP READOUTS & MOTOR MOTION GRAPH FOR THIS)	OFF - DIGITAL 5V POWER SUPPLY FAIL	OFF - ANALOGUE 5V POWER SUPPLY FAIL	OFF - NO EXTERNAL POWER IN
	GREEN - ALL ACTIVE	FLASHING GREEN - POSITIVE END STOP REACHED - MOTION HALTED IN THAT DIRECTION FLASHING RED/GREEN - NEGATIVE END STOP REACHED - MOTION HALTED IN THAT DIRECTION	RED - DEMAND BELOW DEADBAND VALUE				

DRIVE UNIT DISPLAY:

NORMAL RUNNING DISPLAY:

INCOMING SPEED DEMAND

MASTER SPEED & DIRECTION

ACTUAL DRIVE VALUE TO MOTOR

END STOP INDICATORS (AS PER STICK)

STICK INFORMATION **S 00 -9 0000 >>**

MOTOR INFORMATION **M 200055AF 28v1**

MOTOR ENCODER POSITION (HEX)

DRIVE VOLTAGE 28.1V SHOWN

STICK OFF / NO COMMUNICATIONS DISPLAY:

NO INCOMING DATA FROM STICK

MOTOR OFF (FAULT) DUE TO NO COMMS FROM STICK

END STOP INDICATORS (AS PER STICK)

STICK INFORMATION **S - - - - MO!! >>**

MOTOR INFORMATION **M 20005BF2 28v1**

MOTOR ENCODER POSITION (HEX)

DRIVE VOLTAGE 28.1V SHOWN

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CONNECTIONS & SPECIFICATIONS

#	STICK / DRIVE COMMUNICATIONS 6 Way	STICK PROGRAM / EXT JS 14 Way	DRIVE PROGRAM 14 Way	DRIVE MOTOR (BLDC) 12 Way	DRIVE TRIGGER 6 Way 40V 0.2A MAX
1	RS-485 A	RS-485 A	RS-485 A	ENC A	TRIG 1
2	RS-485 B	RS-485 B	RS-485 B	ENC A!	TRIG 1
3	RF ON!/OFF	RF ON!/OFF	RF ON!/OFF	ENC B	TRIG 2
4	RF SWITCH 0V	RF SWITCH 0V	RF SWITCH 0V	ENC B!	TRIG 2
5	12-40 VDC IN	Ext JS in	Y	5V	TRIG 3
6	0V	Z	Z	0V	TRIG 3
7		STEP	STEP	HALL-A	
8		DIR	DIR	HALL-B	
9		!RESET	!RESET	HALL-C	
10		SWDCLK	SWDCLK	MOTOR PH-1	
11		SWDIO	SWDIO	MOTOR PH-2	
12		12-40 VDC IN	12-40 VDC IN	MOTOR PH-3	
13		5V	5V		
14		0V	0V		

Preliminary Specifications:

Subject to change without notice

Drive Voltage:

12 to 40 VDC

Control Stick External Voltage:

9-40 VDC (prototypes: 34VDC)

Control Stick Battery:

Canon LP-E17 or Equivalent

Operating temp:

Stick: -20 to +50°C Drive: +10 to +70°C

End Stop Accuracy:

+/-2 Encoder Counts (Quadrature)*

* This assumes there are no overload situations, and all is under system control

Motor Types:

Brushed DC, Brushless DC (BLDC) with Hall (Stepper on Request)

Feedback Types

Quadrature Encoder (hall sensors optional, but speed up initialising process)

Motor Drive Current:

Std: 19A(DC) 15A(BLDC) continuous

Higher currents may require forced cooling

Mid: 23A(DC) 18A(BLDC) continuous

Mid & Max available upon request

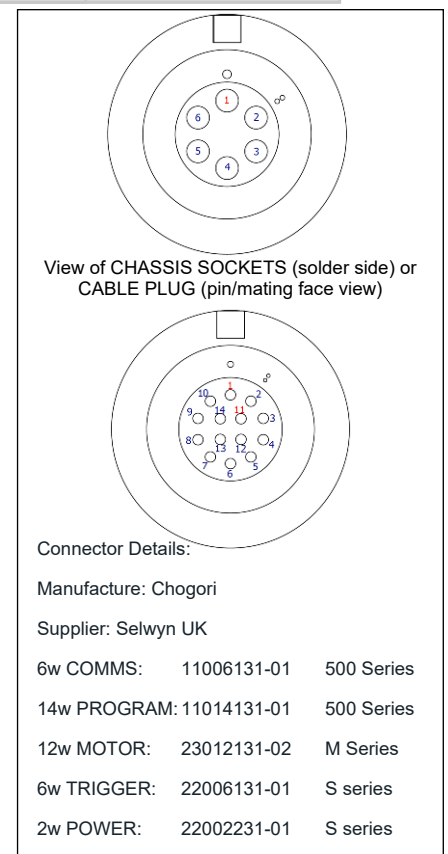
Max: 30A(DC) 25A(BLDC) continuous

Optional RF Unit:

433MHz or 868MHz or 2.4GHz

RS-485 Comms (38400,N,8,1):

For long wire link (<1Km) - incorporated as standard with production version (Prototype systems - optional)



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QUICK CHECKS

FAQs	Answers / Tips	Notes
END STOPS - Setting	Press ^ (up arrow) to set an end stop at the present motor position (- - No endstops) (< - 1 endstop set) (<>, <<,>> both endstops set)	Handset will vibrate briefly (switch must be in RUN position)
END STOPS - Clearing	If BOTH end stops are set, pressing v (down arrow) will clear both end stops (after a prompt to press again to confirm)	Handset will vibrate for longer than setting stops (Switch must be in RUN position). If the action is not confirmed within 4 seconds or so, the system will revert back.
SHOT BOX - Setting	Press centre button to access "STORE POSITION" screen, then enter current motor position into memory using ^, v, <, > buttons.	Switch must be in RUN position - Note: If these positions are stored before user end stops are set, then they will over-ride user end stops.
SHOT BOX - Recalling	Press corresponding ^, v, <, > button	Switch must be in LOCK position
LOOP POSITION PLAYBACK	Press the CENTRE button to enter loop mode. ^ or v selects moves to be included. Nav wheel selects 0-9 or continuous looping, and the pot selects 2-59 seconds, or 1-40 minutes idle time between moves.	Switch must be in LOCK position. Note that due to transmission times, there can be a small delay (approx 100-200mS) variation in idle time.
Automatic hard stops (< or >)	These are detected in the drive (TED). They are not user editable and should not be used as an alternative to user end stops - and are a protect	Hard end stops can only be cleared by re-powering the drive unit.
EXTERNAL INPUT - Selecting footpedals or joystick Pin 14 = 0V, Pin 5 = 0-5V MAXIMUM	Press centre switch until "INPUT: (EXT /INT)" appears on LCD. Use < or > to switch between internal joystick & external input. If connected, balancing of references occurs on start-up.	Plug these in BEFORE powering up the stick, as the reference voltages are measured & balanced on stick power-on. Switch stick to OFF to save INT/EXT input setting in memory.
Issues / Errors		
Stick battery is low - will settings be cleared if it's removed?	End stops & shotbox settings will be kept. If you want to keep current DECEL / RAMP / GEAR settings, move switch to OFF before removing battery.	Placing the switch in the OFF position instructs the local settings in the handset to be stored to memory.
Motor moves freely - No control - Displays show "MO !!" or "MOTOR FAULT"	If the handset switch is in OFF position, or there is a comms failure, the drive will be disabled. Moving the switch to LOCK or RUN should enable the drive.	Drive faults should be cleared by moving the switch from OFF to LOCK / RUN . Motor positions will not be lost unless drive power is reset.
Motor reset not effective	If the power supply is not capable of delivering the required motor current, then a low voltage fault occurs	This fault can only be reset by removing, then re-applying drive power.
Drive LCD displays "NO COMMS"	Communication not established - check handset switch is in LOCK or RUN position - else check cable.	The handset will not show motor speed / drive battery voltage if no comms.
Stick LCD states "No Comms" and "Vm !!"	As above - Also check drive battery	
Switching off RF (if installed)	Plugging in the COMMS cable (RS-485) will power off the RF links, saving power.	This cable will disable only the RF unit to which it is connected. Plug in both ends to disable both RF links.

LEDs:

1 - Switch Position:

Off = Stick off
RED = Lock (only joystick, pot & shotbox buttons operate)
GRN = Run (Everything active)

2 - End stop status:

Off = No end stops set
Green = End stops ON but not reached (accompanied by <> on LCD)
Flashing (RED or RED/GRN) = At limit (accompanied by << or >> on LCD)

3 - Joystick direction (Off = deadband / centred, else red / green)

4 - Data Tx/Rx indicator (should be pulsing)

5 - Internal analogue PSU active

6 - Internal digital PSU active

7 - External power input