PALS96 - Menus and Errors

Version 2h0 19/04/97. Roger Rushbrooke

Menu Structure

The Menu is reproduced in full below. Note that this is shown with child menus *above* their parent. This reflects the way that the UP and DOWN keys scroll through the menu structure. Defaults marked with '*' are set at build time and may be different for each channel.

The Diag menus are by default not shown. To enable these, press and hold UP and DOWN then press ENTER while in any menu (except the Mode Display). Diag then stays enabled until the unit is power cycled.

When in the Mode Display (eg d.001 displayed), press and hold UP and DOWN then release to go directly to the DMX/MRL address menu which can be modified if desired. Press MENU or SELECT to save the changes and return to the Mode Display.

Menu (level 1..3)		Values	Default	Usage
Rst		(BUSY)	-	reset Pals and restart
	Chk	(BUSY)	-	check eeprom values
	Clr	(BUSY)	-	reset eeprom with defaults
Ee				Eeprom Facilities
	Volt	(BUSY)	-	5V & 24V
	Ram	(BUSY)	-	ram
	Flas	(BUSY)	-	flash page CRCs
	Moto	(BUSY)	-	motor outputs and inputs
	Eepr	(BUSY)	-	eeprom read/write
	Led	(BUSY)	-	toggle leds 5 times
	Uart	(BUSY)	-	uart loopback (RS485)
	Key	(CYCLE key)	-	show key press
	Disp	(CYCLE 1..32)	-	display segment, UP cycles segs, DOWN cycles intensity
Test		-		Tests
	24Hi	(..24..)	-	max voltage since powerup
	24Lo	(..24..)	-	min voltage since powerup
	24v	(..24..)	-	24v supply
	5Hi	(..5..)	-	max voltage since powerup
	5Lo	(..5..)	-	min voltage since powerup
	5v	(..5..)	-	5v supply
Volt		-		Monitor Voltages

	Pos#	(0..999)	-	MRL current position (moves towards Req over time)
	Req#	(0..999)	-	MRL required position (deferred or immediate)
	Nex#	(0..999)	-	MRL deferred next position
	Thi#	(0..999)	-	MRL deferred this position
	Pre#	(0..999)	-	MRL deferred previous position
	Jam#	(-ve,+ve)	-	position at start of timeout, -ve if jammed
	Mot#	(-2,-1,0..)	-	motor running (-2), disabled (-1) or timing out (0..)
	CHi#	(0..1023)	-	max/min motor current since startup
	CLo#	(0..1023)	-	
	Cur#	(0..1023)	-	actual motor current
	PHi#	(0..1023)	-	max/min pot position since startup
	PLo#	(0..1023)	-	
	Pa #	(0..1023)	-	actual (current) pot position
	Pd #	(0..1023)	-	desired pot position
	Out#	(0..±127)	-	PID output (to motor)
	Dif#	(0..±1023)	-	PID Dif (differential) term
	Sum#	(0..±1023)	-	PID Sum (integral) term
	Err#	(0..±1023)	-	PID Err (proportional) term
	Chan	{..chan..}	-	channel to monitor (#above)
Mon		-		Monitor Channels
	Tim#	0,1..254	*	max MRL time (secs), 0 is disabled
	Cur#	1..1023	*	cutoff motor current (fault if above this)
	Ran#	0..1023	*	operating pot range and min
	Min#	0..1023	*	(input position scaled between these to give Pd)
	Out#	0..127	*	max ± motor output (can be further limited by Input Vel)
	Jam#	1..99	*	motor jammed if Pa moved less than this after 10 sec
	End#	0..10	*	stop if Pa within this of Pd
	Acc#	1..127	*	max acceleration and triple max deceleration
	Lim#	0..1023	*	limit max Sum
	Dec#	1..256	*	+ve: Sum velocity decay
		-256..0		-ve: Sum fixed decay
	Kd #	0..256	*	PID algorithm constants
	Ki #	0..256	*	
	Kp #	0..256	*	
	Chan	{..chan..}	-	channel to configure (#above)
Conf		-		Configure Channels
	Tes#	(0..1023)	-	test channel calibration (SELECT/MENU to quit)
	Set#	(-50..0..50)	-	set channel calibration (UP/DOWN to adjust)
	Chan	{..chan..}	-	channel to calibrate (#above)
Cal		-		Calibrate Channels
Diag		-		Diagnostic Facilities (UP+DOWN then also SELECT)
SCCS		(text)	-	source control version
Time		(hour min sec)	-	time of code build
Date		(day month year)	-	date of code build
Info		(text)	-	manufacturer name and copyright
PCF		(text)	-	name from Pals Configuration File (.PCF)
Code		(text)	-	code version
Ver			-	version information (use UP/DOWN to scroll these)
	Auto	on, off	on	display auto blanks after 10 minutes
	Brig	low, med, high	med	display brightness
Disp		-		setup display
	Flt	(CYCLE ..chan..)	-	show channel faults, SELECT clears
	Elog	(CYCLE 1..10)	-	show error log, SELECT clears all
Err		-		errors and faults
	PHi#	1023..0	1023	high position limit
	PLo#	0..1023	0	low position limit
	Dis#	on, off	off	disable the channel
	Chan	{..chan..}	-	channel to configure (#above)
Ind		-		Individual channel configure (except Man Mode)

	Bump	on, off	off	bumping position has no effect until pos/vel change
	Dej	0..4	0	dejitter lower n bits (DMX only)
	Swap	on, off	off	swap channels 1/2 (Pan/Tilt)
	Inv2	on, off	off	invert channel 2 (Tilt)
	Inv1	on, off	off	invert channel 1 (Pan)
Gen		-		general channel configure (DMX/MRL Modes only)
Set		-		Setup Pals
Pos#		0..1023	0	manually change channel position
Chan		{..chan..}	-	channel to set position of (#above)
Man		-		Manual channel control
V%#		0..1023	0	setup velocity
P%#		0..1023	0	setup position
Chan		{..chan..}	-	channel of preset to setup (#above)
Num		{..preset..}	-	preset to setup (% above)
Pres		-		Presets
Last		{..preset..}	1	last preset (last >= first)
Firs		{..preset..}	1	first preset (first <= last)
Demo		-		Setup Demo mode
Last		{..preset..}	1	last preset (last >= first)
Firs		{..preset..}	1	first preset (first <= last)
Cyc		on, off	off	Cycle presets at switch on else switch off/on is first/next
Swit		-		Setup Switch mode
Baud		9.6..62.5	9.6	baud rate (in KBaud)
Adr		0, 1..249	1	address
Mrl		-		Setup MRL mode
D16		on, off	off	Dmx16 if on else Dmx8 if off
Vel		on, off	on	use velocity channel if on
Adr		1..512	1	address
Dmx		-		Setup DMX mode
Mode		Dmx, Mrl, Swit, Demo, Pres, Stop	Dmx	operating mode

Errors

The Errors list is reproduced in full below.

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/*****************************************************************************
debug errors   (01..09)   put into Error Log

    ERR_PARAM             /* 01 procedure parameter errors       (Locus=0,1..)
    ERR_CONSIS,           /* 02 consistency check errors         (Locus=0..)
    ERR_A2D,              /* 03 A2D already running at restart
    ERR_EESIZE,           /* 04 eeprom data too large for eeprom
    ERR_MRLFRAME,         /* 05 MRL bad frame                    (Locus=various)

/*****************************************************************************
general errors (10..79)   put into Error Log

    ERR_EEDEAD            /* 10 eeprom dead
    ERR_EECRC,            /* 11 eeprom bad crc
    ERR_EEVER,            /* 12 eeprom data version different to expected
    ERR_DISPDEAD,         /* 13 display dead
    ERR_ERRCHECK,         /* 14 eeprom error log not valid
    ERR_MENUCHECK,        /* 15 eeprom variables out of range    (Locus=MenuDef index)

    ERR_UFRAMING,         /* 16 uart Rx framing
    ERR_UPARITY,          /* 17 uart Rx parity

    ERR_STUCK,            /* 18 (test) Key stuck                 (Locus=A2DKeyState)
    ERR_VLO,              /* 19 (test) low voltage               (Locus=24/5 volts)
    ERR_VHI,              /* 20 (test) high voltage              (Locus=24/5 volts)
    ERR_URXNUM,           /* 21 (test) uart loopback rx bad count
    ERR_URXBAD,           /* 22 (test) uart loopback rx data bad
    ERR_EEBAD,            /* 23 (test) eeprom read data bad
    ERR_MOTJAM            /* 24 motor jammed                     (Locus=chan)

/*****************************************************************************
system faults  (70..79)   put into Error Log, system halted

    ERR_MAIN              /* 70 main() drop thru
    ERR_INT,              /* 71 unexpected Interrupt             (Locus=int1..24)
    ERR_RAM,              /* 72 (test) ram failure
    ERR_FLASH,            /* 73 (test) flash checksum bad        (Locus=page0..7)

/*****************************************************************************
channel faults (80..89)   put into Error Log, set chan Fault with error

    ERR_CHAN,             /* 80 internal (debug) error           (Locus=chan)
    ERR_MOTPWM,           /* 81 (test) motor pwm failure         (Locus=chan)
    ERR_MOTCUR,           /* 82 (test) motor no current          (Locus=chan)
    ERR_REVERSED,         /* 83 pot or motor wiring reversed     (Locus=chan)
    ERR_RANGE,            /* 84 pot outside legal range          (Locus=chan)

/*****************************************************************************
channel faults (90..99)   as above but cleared when Velocity=min

    ERR_OVERCUR,          /* 90 motor overcurrent                (Locus=chan)
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