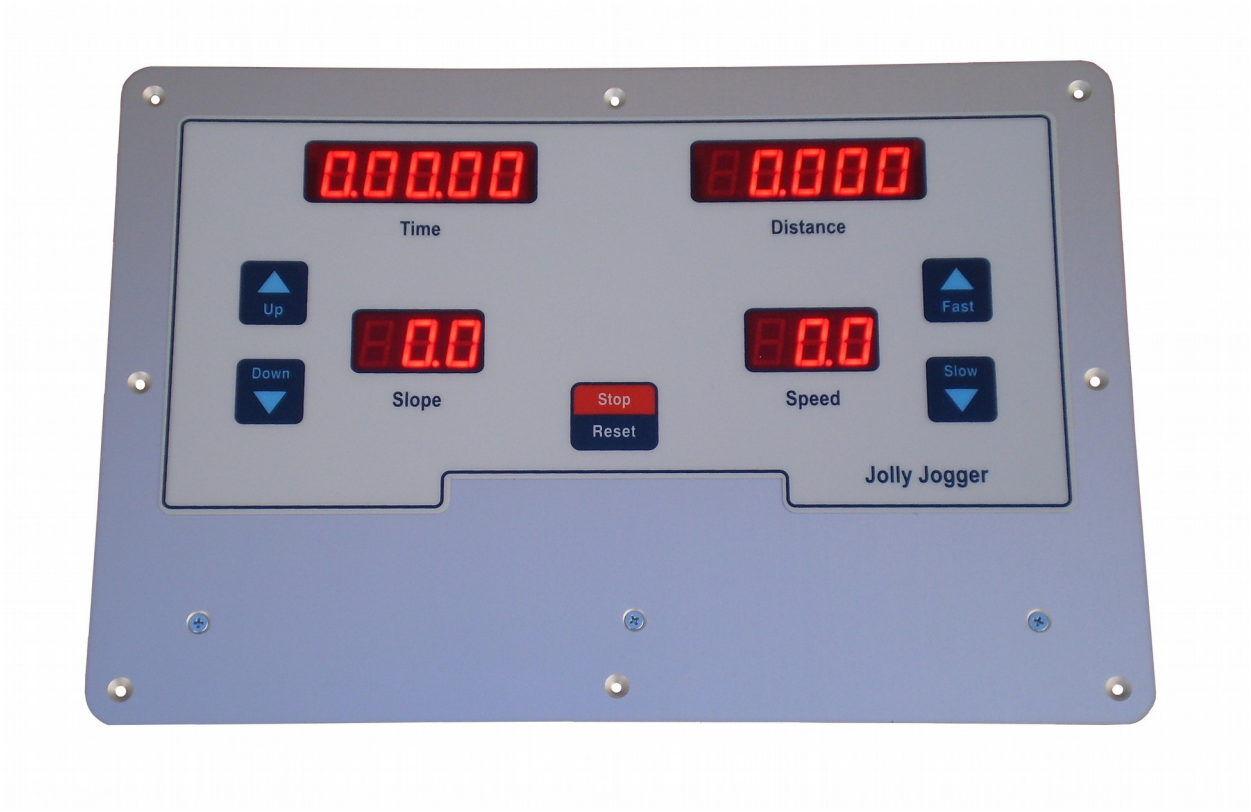
JOLLY JOGGER TREADMILL CONTROLLER



INSTALLATION

AND

OPERATION

MANUAL

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1. INTRODUCTION

This manual describes the installation and operation of the Jolly Jogger treadmill controller v2.

The Jolly Jogger control offers a simple, versatile and comprehensive solution in treadmill applications and is an effective, efficient and popular choice for retrofits. The only external item required to realize a functioning treadmill is the variable speed AC or DC drive with the Jolly Jogger monitoring and controlling all treadmill activity.

The Jolly Jogger integrates all the functions expected in a treadmill application:

- Drives the treadmill variable speed AC or DC motor drive,
- Directly controls the slope motor rise and lower movements,
- Estimates or uses the available encoder feedback in measuring treadmill speed and travelled distance,
- Estimates or uses the available slope encoder/potentiometer feedback in measuring slope angle,
- Incorporates all user safety and operational safeguard procedures, and
- Features a simple, "clean" and attractive user interface with large LED displays and tactile switches.

All aspects of Jolly Jogger operation are set and controlled by configuration parameters kept in non-volatile memory. The parameters are accessible/set via the front panel display and switches or the board's serial port with the available monitoring/setup software and interface.

This manual goes through the installation, parameter programming and operation of the controller.

2. HARDWARE INSTALLATION

2.1 Hardware overview

The controller is designed for 50-60 Hz supply lines of 115 and 230 VAC and with the following characterizing features:

- Standard drive interface: The speed controller (typically an AC inverter or DC drive) is driven with a 0-10 VDC control signal and an enabling or direction setting optotransistor output which can be connected to both, PNP (active-high, current source) and NPN (active-low, current sink) inputs. Practically any inverter/drive can be used.

- Universal slope control: The raising or lowering mechanism is controlled by independent 8 A, dual contact relays and, as such, can be driven with any, DC or AC, voltage in single or dual winding connection. Terminal/limit switches can be internal or external and position feedback can come from an encoder or a potentiometer.

- 24 VDC I/O: The available I/O interface signals are the up/down terminal switch inputs, the speed/slope encoder inputs and the drive enable output. They are all standard 24 VDC types and optoisolated from the internal logic.

- Safety switch interface: In the usual case where some of the inputs (typically the limit switch inputs) are not used, the uncommitted inputs can double as general enables by connecting them to one or more safety switches.

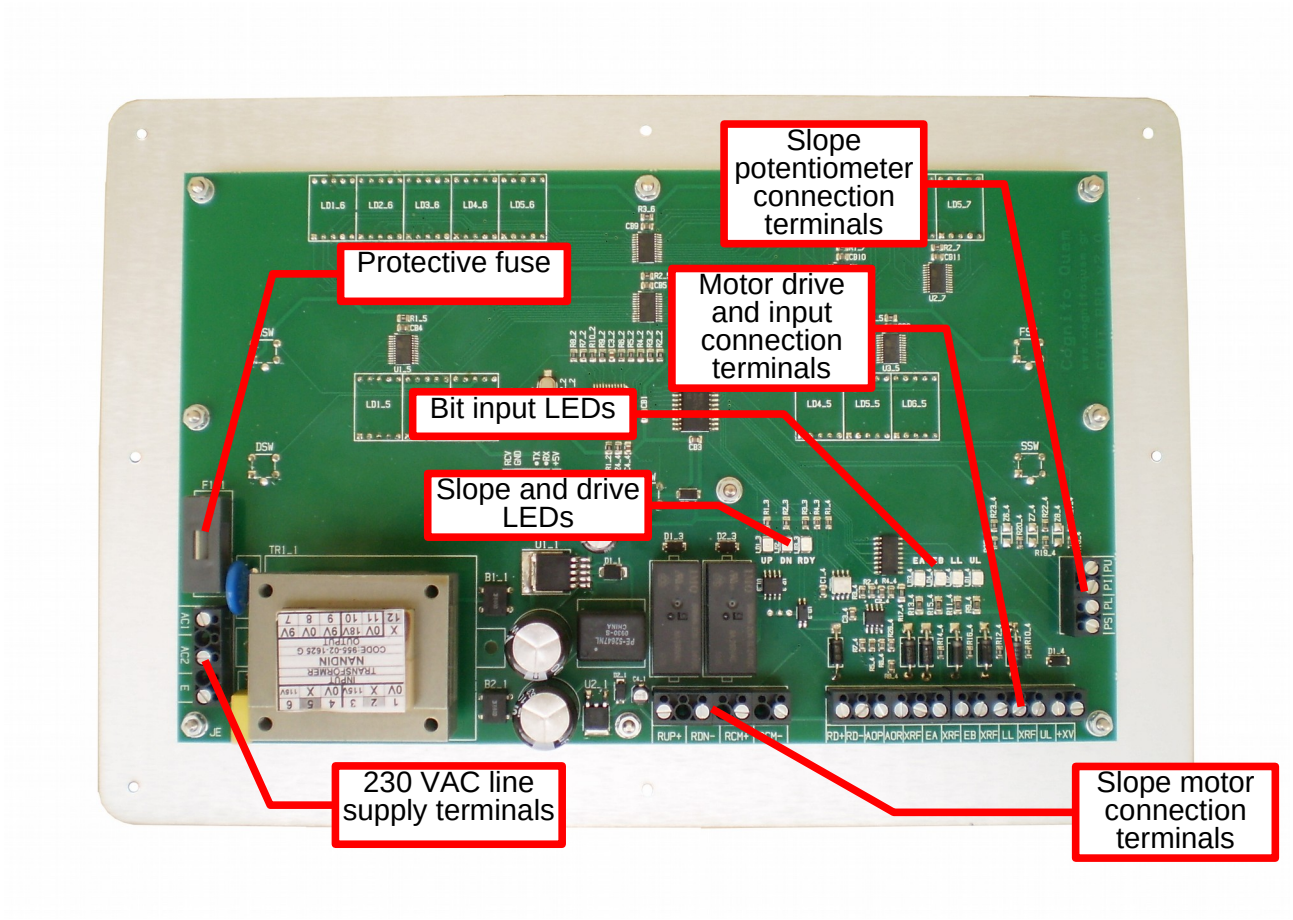
- Dimensions: The anodized alluminium front panel is 2 mm thick and sized 30 x 20 cm (11.8 x 7.9 in). The controller PCB is fixed at its back and with its 249 x 152 mm (9.8 x 6 in) dimensions allows for the assembly to "drop" into a suitably sized hole and be fastened with countersunk screws at the front.

All connections are made at the terminal blocks on the controller board.

2.2 Mechanical installation

The controller is fixed on any suitable surface/bracket using the front panel mounting holes.

2.3 Jolly Jogger connection overview



2.4 AC power circuit connection

The controller operates from 230 VAC, 50 - 60 Hz sources and is protected against overvoltages. Subject to local regulations, the supplied 0,1 A fuse is suitable for most purposes.

WARNING! As the supply voltages are of dangerous level, ALL connections must be made with the power OFF and by QUALIFIED personnel.

AC Power Supply Connection Table	
Terminal	**Connection**
AC1	Supply LIVE
AC2	Supply NEUTRAL
E	Protective EARTH grounding. Internally connected to the front panel.

2.5 Motor drive connections

The speed motor drive is connected as follows:

Speed Motor Drive Connection Table	
Terminal	**Connection**
RD+	“Ready” output optotransistor collector. Connected to the positive supply in PNP (or source) systems or the drive “Run”, “FWD”, “REV” etc input in NPN (or sink) systems.
RD-	“Ready” output optotransistor emitter. Connected to the drive “Run”, “FWD”, “REV” etc input in PNP (or source) systems or the negative/ground in NPN (or sink) systems.
AOP	0-10 VDC analog speed command output.
AOR	Analog speed command output reference/ground.

When the “Ready” output is asserted, the “RDY” output LED is also on.

Typical connection arrangements are shown in p. 6.

2.6 Bit input connections

The four inputs are NPN (current sink), 24 VDC types and connected as follows:

Bit Input Connection Table	
Terminal	**Connection**
EA	Speed encoder channel A, slope encoder channel B or enable input.
EB	Slope encoder channel A, speed encoder channel B or enable input.
LL	Lower limit terminal switch or enable input.
UL	Upper limit terminal switch or enable input.
+XV	External +24 VDC to power small feedback devices such as encoders, proximity pick-ups etc.
XRF	Input signal return/ground and external supply reference/ground.

When any of the inputs is asserted, the respective input LED is on.

Typical connection arrangements are shown in p. 6.

2.7 Slope motor connection

The slope motor is controlled by a pair of 2-pole, NO/NC relays which can drive both dual- (separate) and single- winding motors.

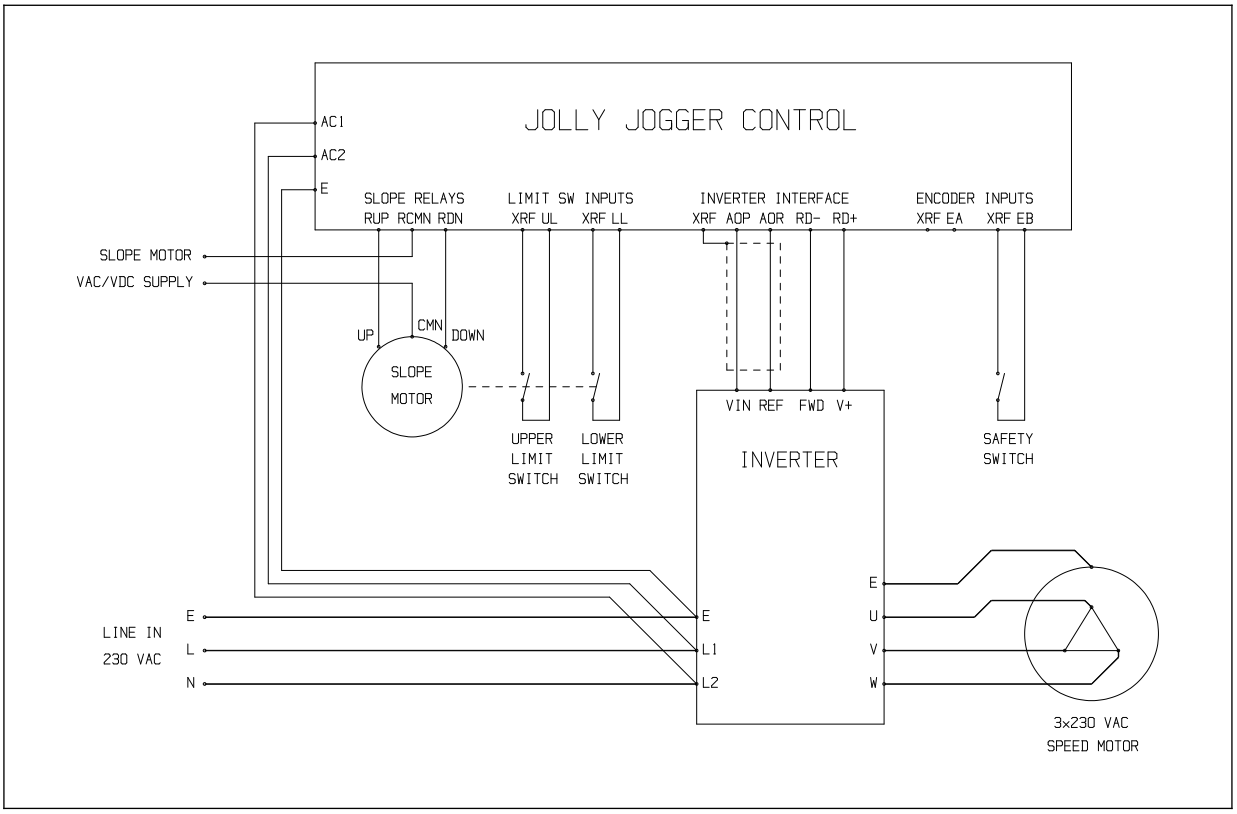
The connection is made as follows:

Slope Motor Connection Table	
Terminal	**Connection**
RUP+	Up command connection. When moving up, connects to RCM+ and when moving down connects to RCM-.
RDN-	Down command connection. When moving down, connects to RCM+ and when moving up connects to RCM-.
RCM+	Positive common. Connects to RUP+ when moving up and to RDN- when moving down.
RCM-	Negative common. Connects to RDN- when moving up and to RUP+ when moving down.

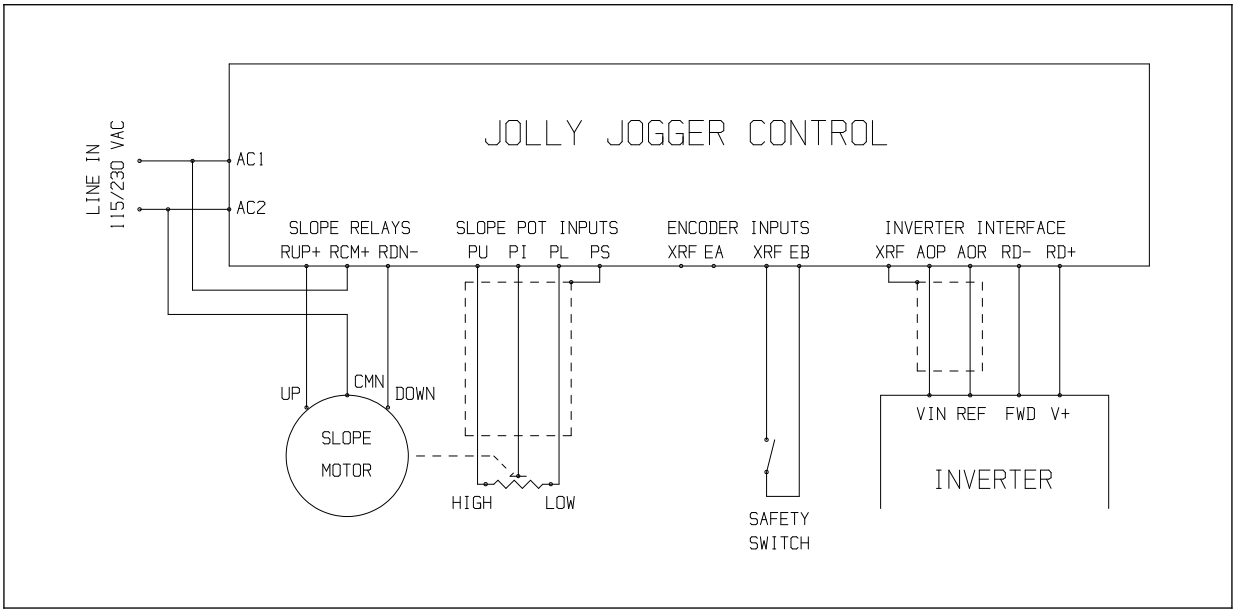
When any of the relays is on, the respective “UP” or ”DN” LED is on.

With dual-winding motors only one of the common connections is used. Typical connection arrangements are shown in p. 6.

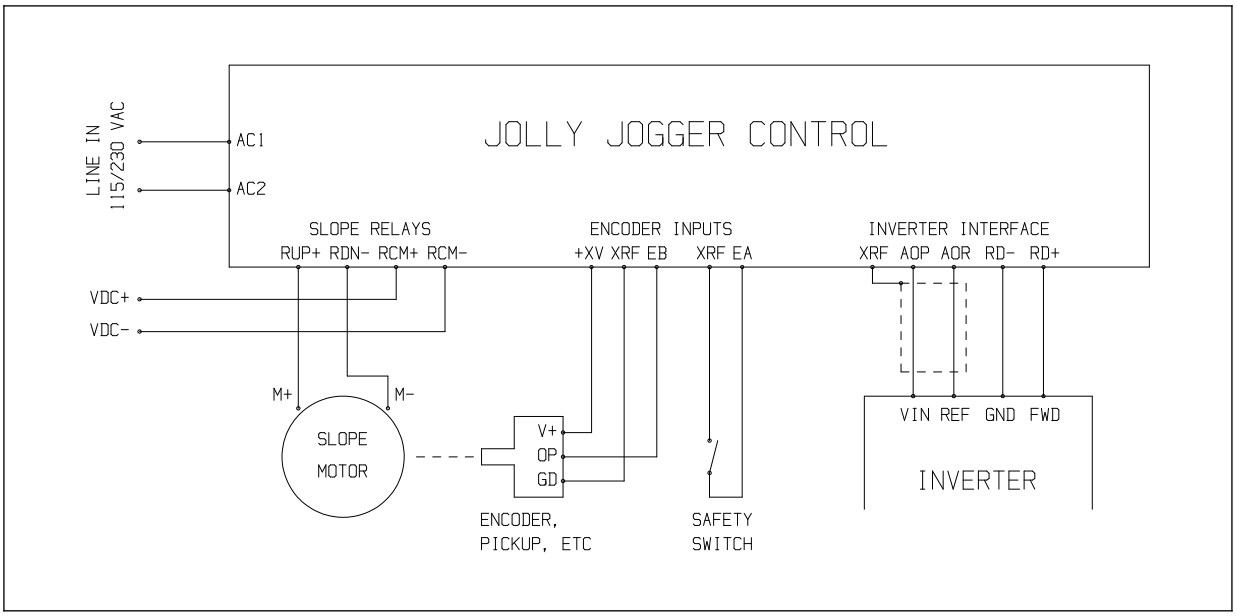
2.8 Typical connection arrangements



Typical treadmill setup with external limit switches and no motor or slope feedback. The inverter is driven with 0-10 VDC speed and run command in PNP connection. The slope motor is controlled in dual-winding mode. The normally closed safety switch enables operation via the EB input.



Typical connection to a dual-winding, AC slope motor with potentiometer feedback.



Typical connection to a single winding DC slope motor with encoder feedback.

3. PARAMETER PROGRAMMING

3.1 Overview

The controller configuration parameters (“Configuration”) are set with the aid of the jolly_jogget_jobs.exe software running on a PC connected to the controller programming pins or, manuallly, via the front face user interface.

Parameters are first presented as organized in the system menu.

3.2 Parameter manual setting via the front panel

Front panel parameter programming by the user/operator is organized in a three-level menu structure grouped as summarized by the table:

Console Parameter Menu Groups	
Parameter Group	**Group Members Description**
`Oprtn`	General operation parameters menu and submenus
`Setup`	Installation and setup parameters menu and submenus

Parameters are organized under each group in menus and further submenus if necessary. Each is described in the following chapters.

All parameters can be set at any time while the console is powered. In this way the controller operation can be determined dynamically (as in the case of fuzzy control).

Displayed parameter names and values are shown as they appear on the Controller display in `mono` font as with `Oprtn` and `Setup` above. Menu positions are shown in navigational step format of the menu entries separated by the "»" character. As such, the “`Ed.tno`“ edit time-out parameter under the “oPtn.t“ operation timing menu in the “`Setup`“ group is referred to as "`Setup` » `oPtn.t` » `Ed.tno`".

Parameters are protected by an internal general “Allow changes” parameter (cleared by `Setup` » `Servc` » `Loc.Ed` and set by `Setup` » `Servc` » `UnLoc`).

Parameters can also be backed-up and restored as needed via the `Setup` » `Servc` » `bAcUP params` and `Setup` » `Servc` » `rStor` menu entries.

3.2.1 Parameter Menu Navigation and Programming

The console parameters can be read and set locally by operating the front panel switches. The table summarizes the programming procedure (and operation):

Console Parameter Menu Navigation and Programming			
Switch	**Normal Operation**	**Parameter/Action Selection**	**Parameter Setting/Action Execution**
Slow + Reset	Changes to parameter selection state.		
Slow		Selects the displayed menu, parameter or action to enter, read/set or execute.	Executes the selected action or sets the parameter to the displayed value and returns to the parameter selection state (if allowed).
Fast + Reset	Start/stop of normal, operation (if enabled)		
Fast		Exit from the parameter selection state or current menu level.	Returns to the parameter selection state without changing the parameter or executing the action.
Up	Ignored	Displays the next parameter, control record or group.	Increases the displayed value.
Down	Ignored	Displays the previous parameter, control record or group.	Decreases the displayed value.

When no parameter changes are allowed locally (Internal “Allow changes” parameter), the user can only read the parameter values by following the above sequences.

The parameter programming procedures are under a time-out specified by the `Setup` » `oPtn.t` » `Ed.tno` parameter (p. 17). If no switch is pressed for the specified time, parameter editing is canceled at time-out.

When incrementing/decrementing real and integer values, the value changes logarithmically. The step is halved at every change between increasing and decreasing direction, thus converging at the required value very quickly.

3.2.2 Setting the Operation Parameters Group `Oprtn`

The group handles the parameters associated with general Controller operation as follows:

Front Panel Operation Menu Parameters	
Menu Position	**Parameter/Action**
`Oprtn » diSPL`	Display jobs submenu
`» CaLib`	Enables the calibration display, p. 12.
`» StAtS`	Enables the status display, p. 13.

3.2.3 Setting the Setup Parameters Group `Setup`

The group handles the parameters associated with controller setup as follows:

Front Panel Setup Menu Parameters	
Menu Position	**Parameter/Action**
`Setup » Snr.In`	Sensor/encoder submenu, p. 13-14.
`» rn.Enc`	Enables run encoder processing.
`» Sl.ch.b`	Enables slope encoder channel B processing.
`» En.A.in`	Sets the EA input as an enable input.
`» A.Lo.E.A`	Sets the EA input as active low.
`» Sl.Enc`	Enables slope encoder processing
`» rn.ch.b`	Enables run encoder channel B processing.
`» En.b.in`	Sets the EB input as an enable input,
`» A.Lo.E.b`	Sets the EB input as active low.
`» Sl.Pot`	Enables slope potentiometer processing.
`» r.Avg.S`	Sets the number of samples in the running average calculation.
`» Ad.oFS`	Sets the ADC potentiometer count at zero slope.
`» Z.SLP`	Sets the current slope as the zero level.
`Setup » Lin.In`	Limit inputs submenu, p. 14
`» Lo.Lin`	Enables low limit switch input processing.
`» i.L.Lin`	Enables internal low limit processing.
`» En.L.Ln`	Sets the low limit input as an enable input.
`» A.Lo.L.L`	Sets the low limit input as active low.
`» Hi.Lin`	Enables high limit switch input processing.
`» i.H.Lin`	Enables internal high limit processing.
`» En.H.Ln`	Sets the high limit input as an enable input.
`» A.Lo.H.L`	Sets the high limit input as active low.

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Front Panel Setup Menu Parameters	
Menu Position	**Parameter/Action**
Setup » CntrL	Control parameters submenu, p. 15-16.
» r.Enc.P	Sets the run encoder count per meter.
» SP.Ftr	Sets the multiplier to convert to displayed speed, typically km/h.
» AoP.Fc	Sets the multiplier to convert the drive output command to estimated distance per sampling interval. Used when no run encoder is available.
» SLP.Fc	Sets the slope x10 degs per slope encoder count.
» UP.tic	Sets the rising slope count change per internal timing “tick”. Used when no slope encoder is available.
» dn.tic	Sets the falling slope count change per internal timing “tick”. Used when no slope encoder is available.
» Hi.SLP	Sets the slope count at the upper limit.
» Lo.SLP	Sets the slope count at the lower limit.
» SLP.tn	Sets the slope movement time-out.
» Sav.Hi	Saves current slope as the upper limit.
» Sav.Lo	Saves current slope as the lower limit.
» no.SLC	Skips slope calibration at power-up.
» Lo.rSt	Returns to zero slope on session reset.
» SL.tno	Slope encoder pulse time-out.
» rn.SEt	Enable run speed setpoint command.
» SL.Set	Enable slope setpoint command.
» qStrt	Enable quickstart function for the stop/reset user input.
Setup » nEt	Seria communications submenu, p. 17.
» nEt.to	Enables net activity time-out.
» n.cd.to	Enables incoming net command time-out.
» Eor.ch	Enables XOR checksum checking
» bAUd	Sets the port baud rate.
» AdreS	Sets the controller identity/address.
Setup » drivE	Drive parameters submenu, p. 15.
» Lo.drv	Sets the minimum run command value.
» Hi.drv	Sets the maximum run command value.
» Strt.t	Sets the starting time allowance for the run motor.
Setup » oPtn.t	Operation timing parameters submenu, p. 17.
» Ed.tmo	Sets the parameter editing time-out.
» idL t	Sets the forced idle time after a fault/error.
» AncE.t	Sets the duration of announcement messages.
» quEt.t	Sets the maximum time in the quiet state.
» SnPL.t	Sets the input sampling time.
» AoP.Ch	Sets the time to sample repeated/continuous user switch activation.
» AoP.St	Sets the output command step under repeated user switch activation.
» dbncE	Sets the input and switch debouncing time.

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Front Panel Setup Menu Parameters	
Menu Position	**Parameter/Action**
Setup » USEr	User parameters submenu, p. 18.
» Sync.E	Suppress synchronization error.
» run	Enables normal operation immediately after power-up.
» qt.Err	Go quiet after an error.
» iGn.OP	Ignore user start/stop operation commands.
Setup » SErvc	Service jobs submenu, p. 18.
» VErsn	Shows the softwate version and release numbers
» tyPE	Shows hardware type number.
» CLr.Er	Clears all errors.
» Er.Src	Shows the internal error source code address.
» Loc.Ed	Disables parameter editing.
» UnLoc	Enables parameter editing.
» rStor	Restores parameters from the backup.
» bAcUP	Backs up current parameters.
» L.dFLt	Loads default parameters.
» LoGd.h	Shows the logged trial hour count.
» triAL	Sets the number of trial hours.

3.3 Configuration parameter description

The description of each parameter follows.

3.3.1 Calibration variables display

The parameter enables the displaying of calibration data. These are the run, slope and run command counts.

At power-up the facility is disabled.

3.3.2 Status variables display

The parameter enables the displaying of status data. These are the current error, operation state, each bit input/output and run command count.

At power-up the facility is disabled.

3.3.3 Run encoder input parameters

The run encoder input (“EA”) can be used in three modes:

- Run encoder channel A, enabled by menu entry `Setup » Snr.In » rn.Enc.`
- Slope encoder channel B, enabled by menu entry `Setup » Snr.In » Sl.ch.b.`
- Enable input enabled by menu entry `Setup » Snr.In » En.A.in.` The input logic (active high/active low) is set by menu entry `Setup » Snr.In » A.Lo.E.A.`

When not used, the above parameters must be disabled.

3.3.4 Slope encoder input parameters

The slope encoder input (“EB”) can be used in three modes:

- Slope encoder channel A, enabled by menu entry `Setup » Snr.In » SL.Enc.`
- Run encoder channel B, enabled by menu entry `Setup » Snr.In » rn.ch.b.`
- Enable input enabled by menu entry `Setup » Snr.In » En.b.in.` The input logic (active high/active low) is set by menu entry `Setup » Snr.In » A.Lo.E.b.`

When not used, the above parameters must be disabled.

3.3.5 Slope potentiometer parameters

Slope potentiometer processing is enabled by menu entry `Setup » Snr.In » SL.Pot.`

In addition, the ADC offset must be defined via menu entry `Setup » Snr.In » Ad.oFS` or set by menu entry `Setup » Snr.In » Z.SLP`.

The potentiometer reading is filtered by a running average filter whose sample count is set at menu entry `Setup » Snr.In » r.Avg.S.`

When not used, the `Setup » Snr.In » SL.Pot` parameter must be disabled.

3.3.6 Limit input parameters

The upper and lower limit input (“UL” and “LL”) can each be used in two modes:

- Dedicated limit switch, enabled by menu entries `Setup » Lin.In » Lo.Lin` and `Setup » Lin.In » Hi.Lin.`
- Enable inputs enabled by menu entries `Setup » Lin.In » En.L.Ln` and `Setup » Lin.In » En.H.Ln`. The input logic (active high/active low) is set by menu entries `Setup » Lin.In » A.Lo.L.L` and `Setup » Lin.In » A.Lo.H.L` respectively.

When limit switches are internal to the slope mechanism and not accessible, the menu entries Setup » Lin.In » i.L.Lin and Setup » Lin.In » i.H.Lin must be set respectively. This enables the slope encoder pulse time-out (entry Setup » CntrL » SL.tno) in detecting the upper and lower positions as movement is stopped at these. In the case of potentiometer feedback, the internal limit switch settings enable the detection of potentiometer drift when the lower or upper position values cannot be reached within the maximum slope move time-out (Setup » CntrL » SLP.tn).

When not used, the above parameters must be disabled.

3.3.7 Run speed and distance parameters

The encoder/displacement counts/meter parameter is set at menu entry Setup » CntrL » r.Enc.P. The parameter is the basis for all run speed and distance calculations.

Displacement count per sampling interval (Setup » oPtn.t » SnPL.t) is converted to speed in user units (km/h) by multiplying with the factor set by entry Setup » CntrL » SP.Ftr.

In the absence of a run encoder, the displacement is estimated from the speed command. The speed command (0..255) is multiplied with parameter Setup » CntrL » AoP.Fc and the result is added to the estimated distance count. The speed command minimum and maximum command values is set via parameters Setup » drivE » Lo.drv and Setup » drivE » Hi.drv respectively. When the output command changes to a non-zero value, a time-out applies for run feedback to come through as specified by parameter Setup » drivE » Strt.t.

Speed is incremented/decremented by the user via the “Fast” and “Slow” panel switches. The displayed speed value can be the actual speed or the required setpoint. This is controlled by parameter Setup » CntrL » rn.Set which enables speed setpoint indication. With continuous user input, the output command is incremented/decremented at a rate set by the Setup » oPtn.t » AoP.St.

At session start, the stop/reset switch can also “quickstart” treadmill running if parameter Setup » CntrL » qStrt is enabled.

3.3.8 Slope movement parameters

When no potentiometer is used as slope feedback, slope encoder/displacement count is multiplied by the slope/count factor parameter at menu entry `Setup` » `CntrL` » `SLP.Fc`. The parameter is the basis for all slope calculations.

In the absense of encoder or potentiometer feedback, slope displacement is estimated by parameters `Setup` » `CntrL` » `UP.tic` and `Setup` » `CntrL` » `dn.tic`. When moving up or down, the slope is incremented/decremented by these values respectively at every internal timing “tick” interval (= 0.05 s).

Parameters `Setup` » `CntrL` » `Hi.SLP` and `Setup` » `CntrL` » `Lo.SLP` specify the slope count (estimated, encoder or potentiometer ADC count) at the upper and lower ends respectively. With potentiometer feedback these behave as soft limits and stop slope movement. The slope variable is reloaded with these values when a respective limit input is asserted or slope encoder pulsing times-out (`Setup` » `CntrL` » `SL.tno`). The upper and lower limit counts can also be set via menu entries `Setup` » `CntrL` » `Sav.Hi` and `Setup` » `CntrL` » `Sav.Lo` respectively.

Slope movement is also limited by time-out. Parameter `Setup` » `CntrL` » `SLP.tn` specifies the maximum time needed to travel from one limit to the other. When the time-out is asserted, the “motion error” is set and treadmill operation stopped.

Slope is incremented/decremented by the user via the “Up” and “Down” panel switches. The displayed slope value can be the actual slope or the required slope setpoint. This is controlled by parameter `Setup` » `CntrL` » `SL.Set` which enables slope setpoint indication.

At power-up, slope is decreased until the lower limit is found. This calibration step can be skipped by enabling parameter `Setup` » `CntrL` » `no.SLC.`

At session stop/reset, the slope mechanism can go to zero level if parameter `Setup` » `CntrL` » `Lo.rSt` is enabled.

3.3.9 Serial port parameters

The controller serial port is available for debugging/monitoring purposes and affected by the following parameters:

- Net activity time-out (`Setup` » `nEt` » `nEt.to`) detects interrupted messages, zero for none.
- Net command time-out (`Setup` » `nEt` » `n.cd.to`) detects interrupted regular command flow, zero for none.
- XOR checksum checking (`Setup` » `nEt` » `Eor.ch`) enhances communication robustness, if enabled.
- Port baud rate (`Setup` » `nEt` » `bAUd`) and address (`Setup` » `nEt` » `AdreS`). The valid range of address values is 1..255 with 0 being reserved for broadcasted messages to all members of the network.

3.3.10 Operation timing parameters

Controller operation timing is affected by the following parameters:

- Parameter editing time-out (`Setup` » `oPtn.t` » `Ed.tmo`) limits the time in parameter editing. If no switch is pressed for the specified time, parameter editing is canceled at time-out. When zero, it is ignored and operation stays in parameter editing until exited via the “Fast” switch.
- Forced idle time (`Setup` » `oPtn.t` » `idL t`) sets the controller idle time in seconds. This idle time is spent as a minimum, in quiet, following an error, fault or reboot to avoid any problems during line faults or system errors.
- Duration of informative (announcement) messages (`Setup` » `oPtn.t` » `AncE.t`) sets the display time for such messages.
- Maximum quiet time (`Setup` » `oPtn.t` » `quEt.t`) sets the maximum time in the quiet state after which normal operation starts. When zero, operation has to be started manually.
- Input sampling period (`Setup` » `oPtn.t` » `SnPL.t`) sets the sampling interval of position and slope variables.
- Sampling period to detect continuous user switch activation (`Setup` » `oPtn.t` » `AoP.Ch`).
- User, enable and limit switch debounce time (`Setup` » `oPtn.t` » `dbncE`).

3.3.11 Use parameters

Use parameters affect Controller operation as follows:

- Suppress synchronization error (Setup » USEr » Sync.E): The controller system time and date are initialized as zero at power-up and reported as unsynchronized until set by a network synchronization command via the serial ports. This feature is not required when the controller is operating on its own and this parameter enables such non-synchronized operation.
- Autorun after power-up (Setup » USEr » run): This parameter enables the automatic starting of the controller operation after reset. When disabled, operation starts after the set maximum quiet time or by a net “Go” command.
- Go quiet after an error (Setup » USEr » qt.Err): Used for diagnostic purposes, this parameter forces the controller to stop operating (go Quiet) in the event of a recoverable or non-recoverable error. When disabled, the controller recovers from fault/errors when their cause is removed or reboots after a non-recoverable error.
- Ignore user start/stop operation commands (Setup » USEr » iGn.OP): Set to disable starting or stopping of normal operation via the the front panel "Fast" switch.

3.3.12 Service/maintenance actions

Service actions are used during Controller maintenance as follows:

- Show software version and reease numbers via (Setup » USEr » VErsn).
- Show hardware type number via (Setup » USEr » tyPE).
- Clear all errors via (Setup » USEr » CLr.Er).
- Show internal processing error source code address via (Setup » USEr » Er.Src).
- Disable/lock parameter editing via (Setup » USEr » Loc.Ed).
- Enable/unlock parameter editing via (Setup » USEr » UnLoc).
- Restore parameter back-up via (Setup » USEr » rStor).
- Back-up current set of parameters via (Setup » USEr » bAcUP).
- Load parameter defaults via (Setup » USEr » L.dFLt).
- Show the logged trial hours via (Setup » USEr » LoGd.h).
- Set trial hours via (Setup » USEr » triAL). When non-zero, treadmill operation is available for this total of hours and stops thereafter. Set to disable this feature.

4. CONTROLLER OPERATION

4.1 Overview

On power up the Jolly Jogger controller checks the integrity and valid operational state of the various subsystems and displays the opening message (“HELLO”) and firmware version. Then, depending on the value of the autorun parameter (p. 18), waits for the maximum quiet time down-count (p. 17) or network command to start operation.

Normal operation can only be stopped via a network/serial port command (“Quiet”). While quiet, all outputs are deactivated and not all measurement takes place.

While in normal operation, treadmill speed is started and controlled via the “Fast” and “Slow” panel switches while slope is controlled via the “Up” and “Down” ones. Running is stopped when the “Stop/Reset” panel switch is activated. At this point the session can continue by pressing the “Fast” switch or finish by pressing “Stop/Reset” again whereby the session totals are zeroed and slope returns to level, if enabled (p. 16). A new session then starts either via the “Fast” and “Slow” switches or by pressing “Stop/Reset” again as a “quickstart”, if enabled (p. 15).

All motion is stopped and disabled while any of the enable inputs is disabled (p. 13, p. 14, p. 14).

In the case of an error or fault condition, the Controller enters the idle/quiet state (outputs off). The system recovers when the cause is removed or reboots in the case of unrecoverable errors. If the error condition persists or another one occurs, the controller will again go idle/quiet and wait to recover or reboot depending on the error type. The controller will halt operation on an internal flash memory fault or slope motion time-out (p. 16) in which case operation can only start after cycling the power supply.

Configuration parameters can be edited by entering the editing menu (p. 8) by activating the “Stop” and “Slow” panel switches (p. 9).

4.2 Default conditions

The controller will use backup or default values on an invalid configuration at power up. These values are used to establish communications until a valid configuration is saved.

The defaults are given by the table:

Controller Communication Defaults		
Parameter	**Value**	**Description**
Net Address	255 decimal (0FF hex)	Network address/identity
Baud rate	8 (9600 baud)	Serial port baud rate index
XOR checksum	Off	Additional XOR checksum in communications

Default conditions can also be forced by skipping configuration testing at power up. This is done by keeping the serial receive input active (“Break” signal) for a minimum of 2,5 seconds.

4.3 Displayed error and status messages

The controller displays the following status/error messages (in alphabetic order):

Jolly Jogger status/error messages	
Message	**Description**
BAc.uP	Configuration parameters are being backed-up (p. 18).
CAL.dn	Downwards slope calibration.
CAL.up	Upwards slope calibration.
dF.CnF	Default configuration parameters are being loaded.
dS.bLd	Disabled operation due to deactivated enable input(s).
En.trL	End of trials period (p. 18).
Er.Adc	ADC error. The controller stays active ignoring bad ADC output.
Er.Cmd	Net command time-out (p. 17). Ignored by the controller.
Er.Com	Serial communications time-out (p. 17). Ignored by the controller.
Er.Out	Out-of-range value. Depending on the “Go quiet after an error” parameter (p. 18), the controller will stay active ignoring bad values.
Er.Prc	Internal processing error. Depending on the “Go quiet after an error” parameter (p. 18), the controller will reboot.
Er.SAv	Error in saving/writing to flash memory. Controller operation halts.
Er.Src	Corrupt encoder input. Depending on the “Go quiet after an error” parameter (p. 18), the controller will stay active ignoring bad values.
Motn.E	Slope motion time-out (p. 16). Controller operation halts.
NEt.Er	Serial communications error. Ignored by the controller.
no.bAc	No configuration parameters to restore (p. 18)
no.Err	No error status.
no.tmE	Controller time/date not set (p. 18).
Pot.dr	Potentiometer drift detected (p. 14). Displayed slope value is not valid.
rEAdy	Ready-to-start status.
rEStr	Configuration parameters are being restored (p. 18)
rEt.dn	Downwards return to level slope.
rEt.Up	Upwards return to level slope.

4.4 Recycling information

This product has been designed to be readily recyclable under most jurisdictions. For further information contact us at Cognate Quam Electrotechnologies Ltd, 22 Pigis Ave., Melissia, Athens, Greece 15127, Tel/fax: +30.210.8049475, e-mail: weee@cognitoquam.gr.

Dispose of in accordance with locally applicable laws and regulations.