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Lester Control Systems Ltd

Unit D, 18 Imperial Way, Croydon, Surrey, CR0 4RR.

Tel: **020 8288 0668**
Fax: 020 8288 0667
Email: info@lestercontrols.co.uk
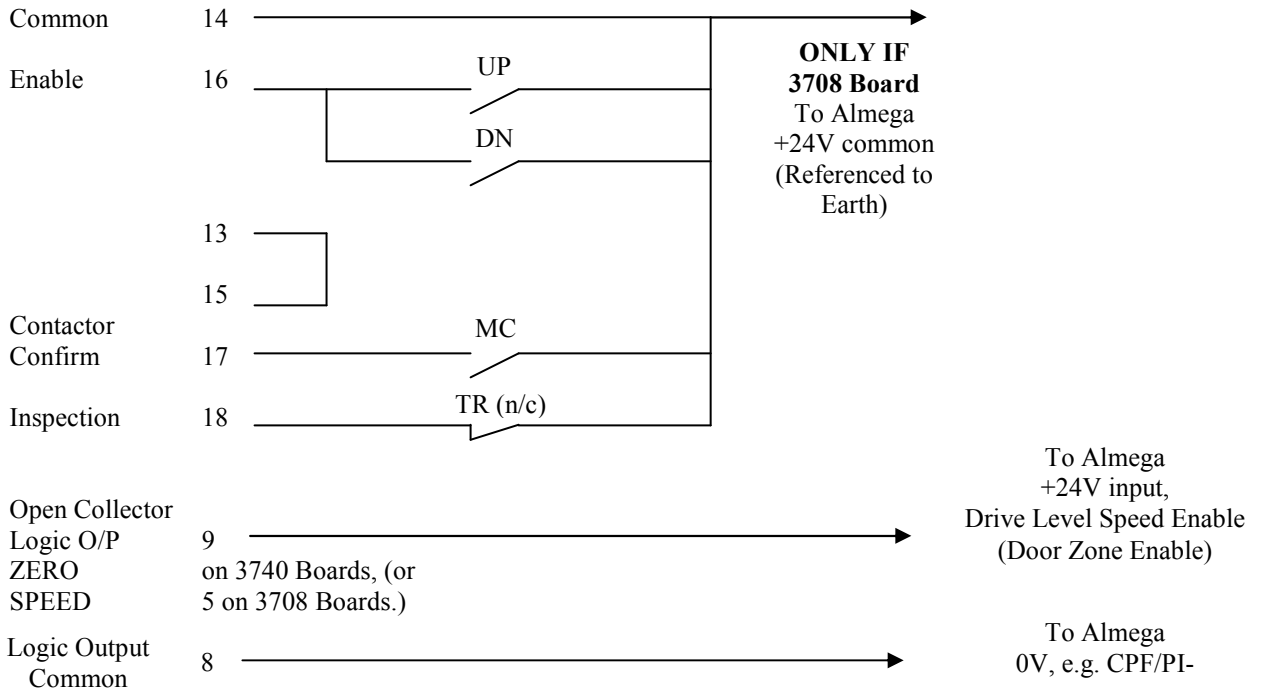Web: www.lestercontrols.co.uk

TECHNICAL MANUAL
FOR THE ALMEGA
MICROPROCESSOR SYSTEM
*"MAGNETEK HPV600/900 DRIVE SERIAL
COMMUNICATIONS SUPPLEMENT"*

ISSUE: 2
Date: 09/04/2009

WE RESERVE THE RIGHT TO ALTER WITHOUT GIVING PRIOR NOTICE TECHNICAL
DATA, DIMENSIONS AND WEIGHTS DESCRIBED IN THIS MANUAL

Contents   **Page**

1)   Contactor / Brake and IO Signals (MAG HPV600/900 SC)

Common   14

Enable   16

UP

DN

ONLY IF 3708 Board
To Almega
+24V common
(Referenced to Earth)

13

15

Contactor
Confirm   17

MC

Inspection   18

TR (n/c)

Open Collector
Logic O/P
ZERO
SPEED   9

on 3740 Boards, (or
5 on 3708 Boards.)

To Almega
+24V input,
Drive Level Speed Enable
(Door Zone Enable)

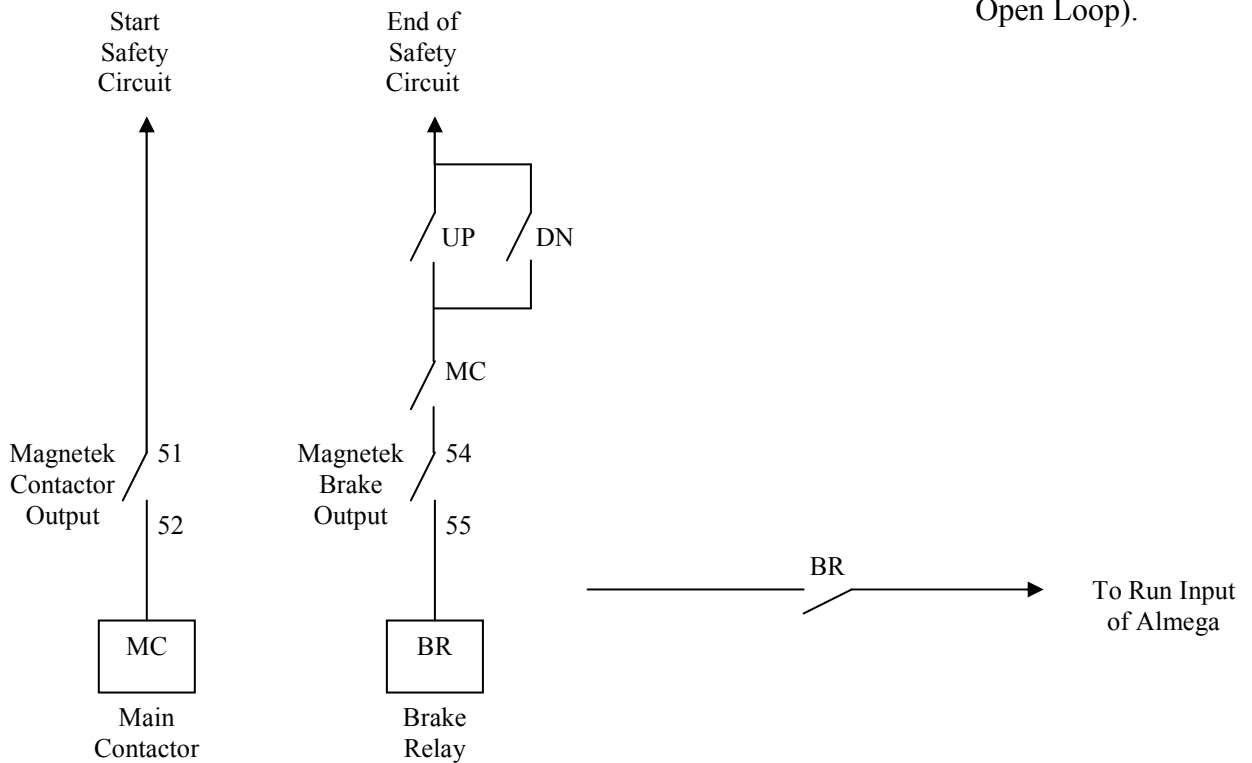Logic Output
Common   8

To Almega
0V, e.g. CPF/PI-

Logic Input Settings-C2

Logic Input 1 = DRIVE ENABLE
Logic Input 2 = CONTACT CFIRM
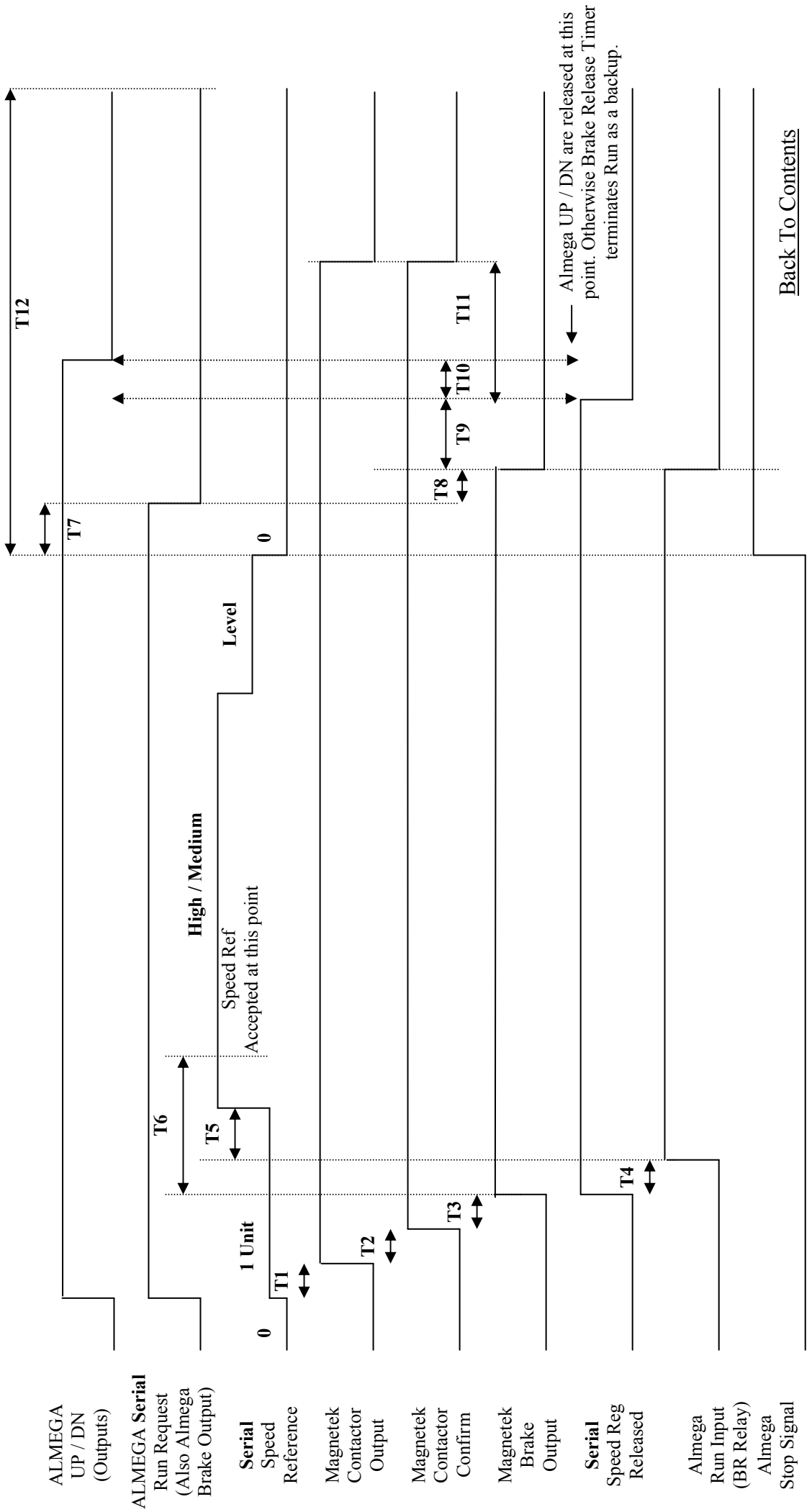Logic Input 3 = SER2 INSP ENA

Logic Output Settings-C3

Logic Output 1   = ZERO SPEED
Relay Coil 1   = CLOSE CONTACT
Relay Coil 2   = AUTO BRAKE
(BRAKE PICK When Open Loop).

Start
Safety
Circuit

End of
Safety
Circuit

UP   DN

MC

Magnetek
Contactor
Output   51

52

Magnetek
Brake
Output   54

55

BR

To Run Input
of Almega

MC

Main
Contactor

BR

Brake
Relay

3

2) Microprocessor Drive & Stopping Sequence (MAG HPV600/900 SC)

T1	=	Time for Contactor Output
T2	=	Time for Contactor Confirm
T3	=	Time for Auto Brake Output
T4	=	Time for Almega Run Confirmation
T5	=	Almega Brake Lift Timer (set to 200mS)

T6, T9	=	BRAKE PICK TIME (Drive Speed Reference Released)
T7	=	Almega Stop Time (500mS typ)
T8	=	AB OFF DELAY
T10	=	Almega Brake Drop Time (Hold Enable Whilst Brake Drops)
T11	=	CONTACTOR DO DELAY
T12	=	Almega Brake Release Timer (Backup Up/Dn stop, set to 3000 Milliseconds)

ALMEGA UP / DN (Outputs)

ALMEGA Serial Run Request (Also Almega Brake Output)

Serial Speed Reference

Magnetek Contactor Output

Magnetek Contactor Confirm

Magnetek Brake Output

Serial Speed Reg Released

Almega Run Input (BR Relay)

Almega Stop Signal

High / Medium

Level

1 Unit

0

Speed Ref Accepted at this point

Almega UP / DN are released at this point. Otherwise Brake Release Timer terminates Run as a backup.

T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12

3) Drive Parameter Configuration (MAG HPV600/900 SC)

3.1) Configure-C1

SERIAL MODE	MODE 1	= SPEED PROFILING
	MODE 2	**= MULTI-STEP**
	MODE 3	= TEST MESSAGE
SER2 FLT MODE	IMMEDIATE	
	RUN REMOVE	
	RESCUE	
SPD COMMAND SRC SERIAL		= SPEED PROFILE
	MULTI-STEP	= BINARY INPUTS
	SERIAL MULTI STEP	**= SERIAL REFERENCE**
	ANALOG INPUT	= ANALOG INPUT
RUN COMMAND SRC	EXT	
	SERIAL	
	SERIAL + EXT	
FAULT RESET SRC	EXTERNAL TB	
	SERIAL (Magnetek Keypad works Also)	
	AUTOMATIC	
STOPPING MODE	IMMEDIATE	
	RAMP TO STOP	
BRAKE PICK SRC	**INTERNAL**	
	SERIAL	

3.2) Adjust-A1

CONTRACT CAR SPD	*See Note 3.1	
SER2 RS INSP SPD	*See Note 3.1	
SER2 RS CRP SPD	*See Note 3.1, (Set to 0.1m/s approx)	
SER2 RS CRP TIME	Time of RUN under rescue mode	180s
SER2 FLT TOL	Communications Lost Timeout Time	500ms
AB ZERO SPD LEV	% of contract speed before dropping brake	0.5%
AB OFF DELAY	Adjust as req'd to give a software stop with the drive.	0.2s
BRAKE PICK TIME	Speed Start / Speed Reg Release (hence contactor drop)	200ms
ZERO SPEED LEVEL	% of contract speed for output Door Zone Enable	Note 3.3
ZERO SPEED TIME	Delay of ZERO speed Output	100mS
CONTACTOR DO DLY	Delay for MC Contactors	1S
CONTACT FLT TIME	Timer for Contactor Confirm Release	1.5S
RESPONSE	Sensitivity of Speed Regulator	10
INNER LOOP XOVER	Inner Speed Loop Crossover Frequency	10

Note 3.1
The ALMEGA micro processor, stores all settings for speed references since they are a numerical reference transmitted over the serial channel. To keep all speed settings in one place, the ALMEGA takes responsibility. Therefore items referred from above <u>can only be set from the ALMEGA</u>. In the event that they are changed at the drive, they will be overwritten by the ALMEGA, at the next available opportunity, i.e. when the drive is not busy.

Note 3.2
When a Serial Position Device is fitted, and an Automatic Learning Run has successfully completed, the Positioning System

Note 3.3
(*set just above SER2 RS CRP SPD)*

3.3)   S-Curves-A2
The Drive has several s-curve sets which are utilized for different lift controls as detailed below:

<u>S-CURVE 0</u>
    Used for: INSPECTION CONTROL,
                                   POSITIONING SYSTEM LEARNING RUN,
                                   RE-LEVELLING.
                                   (See also Note 3.1)
    Values set at: Drive Defaults.
<u>S-CURVE 1</u>
    Used for: ALMEGA PROFILE CONTROL (Normal Operation).
    Values set at: Accel / Decel   = 3.999 m/s²,
                                     ALL Jerks   = 0 (disabled)
<u>S-CURVE 2</u>
    Used for: NOT USED.
    Values set at: Drive Defaults.
<u>S-CURVE 3</u>
    Used for: EMERGENCY SLOWDOWN (i.e. slowdown on limits, Almega
                                   Accel / Decel errors, Drive / Position Device communications lost,
                                   Position Device Errors.)
                                   (See also Note 4.3)
    Values set at: Accel / Decel, and ALL Jerks = **1.5.**

Note 3.1
Where Speed Profile Control is NOT available (i.e. switched off), S-Curve Set 0 will be used on Normal operation instead of Set 2.

<u>Back To Contents</u>

4) ALMEGA Parameter Configuration (MAG HPV600/900 SC)

<u>TRAVEL SETUP</u>

	Units	Min	Max	Default	Set At
STOP TIME	Milliseconds	0	3000	500	3000
BRAKE LIFT TIME	Milliseconds	0	3000	200	0
BRAKE RELEASE TIME	Milliseconds	0	3000	200	3000
DRIVE CONTRACT SPEED	Metres/Second	0	8 (as drive)	0	Site
DRIVE HIGH SPEED	Metres/Second	0	Cont Spd	0	Site
DRIVE MEDIUM SPEED 3	Metres/Second	0	Cont Spd	0	Site
DRIVE MEDIUM SPEED 2	Metres/Second	0	Cont Spd	0	Site
DRIVE MEDIUM SPEED 1	Metres/Second	0	Cont Spd	0	Site
DRIVE LEVEL SPEED	Metres/Second	0	Cont Spd	0	0.060
DRIVE TEST SPEED	Metres/Second	0	0.5 (as drive)	0	0.3
DRIVE SERIAL COMMS LOST	Metres/Second	0	1.54	0	0.1
DRIVE COMMS LOST TIME	Milliseconds	40	3000	200	200
STOP ON RUN RELEASE	YES/NO	NO	YES	NO	YES
DRIVE PROFILE MONITOR	Speed Profile/Command	Profile	Command	Profile	Profile
DRIVE COMMS LOST PROT-T	Seconds	0	1200	200	(Note 4.1)
BRAKE DROP TIME	Milliseconds	0	3000	200	200
PROFLE FINISH SPEED	Metres/Second	0	0.1	0	0.002
LEARN RUN SPEED	Metres/Second	0	0.5	0	0.200
SLOW ON LIMIT S-CURV SEL	YES/NO	NO	YES	NO	NO

Where a Serial Position Device is NOT fitted; modify the above as below:

	Units	Min	Max	Default	Set At
STOP TIME	Milliseconds	0	3000	500	500
DRIVE MEDIUM SPEED 3	Metres/Second	0	Cont Speed	0	(Note 4.2)
DRIVE MEDIUM SPEED 2	Metres/Second	0	Cont Speed	0	(Note 4.2)
DRIVE MEDIUM SPEED 1	Metres/Second	0	Cont Speed	0	(Note 4.2)
SLOW ON LIMIT S-CURV SEL	YES/NO	NO	YES	NO	(Note 4.3)

Ensure lift does actually run at contract speed with tachometer on sheave before setting slowing limits, slowing distances and floor levels. Adjust drive motor details to give correct settings.

<u>Note 4.1</u>
Should be greater than time it takes for lift to run for 2 whole floors on Communications lost speed, e.g. for 3M floor heights @ 0.1m/s, time would be 30s for 1 floor, 60s for 2 floors.
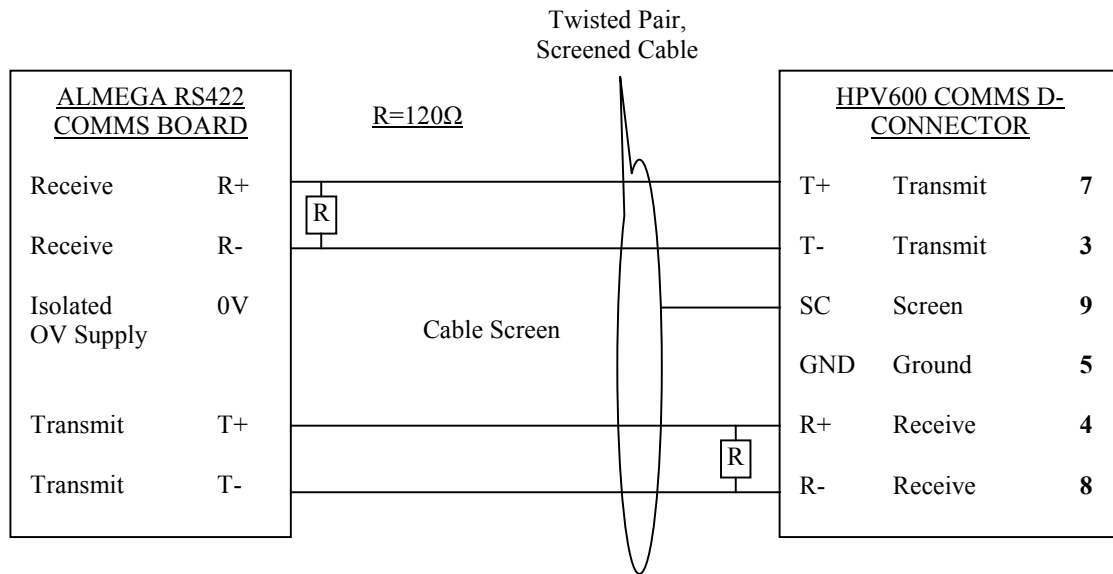
<u>Note 4.2</u>
Set all unused speeds i.e. MS1, MS2 and MS3 (as applicable) to DRIVE LEV SPEED (0.06m/s) as a precaution.

<u>Note 4.3</u>
An option included with Almega software version 3 and above for systems without a serial position device fitted. S-Curve set 3 is selected (Emergency Slowdown) when the lift fails to slow on a normal stepping proximity vane. Thus when s-curve 3 is set with greater deceleration / jerk rates, a quicker slowdown can be achieved when the lift slows on the slowing limits i.e. (Reset Run).

<u>Back To Contents</u>

5)   RS422 Physical Layer (MAG HPV600/900 SC)

Twisted Pair,
Screened Cable

ALMEGA RS422 COMMS BOARD		R=120Ω	HPV600 COMMS D-CONNECTOR		
Receive	R+	R	T+	Transmit	7
Receive	R-		T-	Transmit	3
Isolated OV Supply	0V	Cable Screen	SC	Screen	9
			GND	Ground	5
Transmit	T+		R+	Receive	4
Transmit	T-	R	R-	Receive	8

Note 5

Ensure cable is routed away from any noise source(s) to avoid serial communication errors. Number and type of errors (if any) can be viewed via the windows application software (LcslWin) as required.

Back To Contents

8

6) Windows application software: LcslWin (MAG HPV600/900 SC)

The Windows application software LcslWin is necessary for monitoring and interrogation of the inverter drive. The software will work on any IBM compatible P.C. or laptop (250MHz or higher) with windows version XP or Vista. It can be very useful to ascertain the state of the Inverter drive. Whilst on site the engineer can plug into the serial port of the lift (or serial port of the Internet Board (if fitted)) and extract information as required. Also, if the Internet option is fitted the same information can be viewed remotely.

- Select Almega-> Monitoring ->Magnetek HPV600-900 Drive Viewer.
- Select which lift, by clicking one of the buttons (i.e. 1-6).
- Click the button Start Monitoring, to start the transfer of information.
- Information is transferred / repeated at regular intervals.
- Click on Monitor Profile to monitor profile information in addition to all other info. (Note this increases transfer time slightly).
- Drive Profile(s) can be viewed, compared, stored etc. Drive status, direction, events, alarms, communications information can be viewed by selecting any of the screens, from the tab controls.
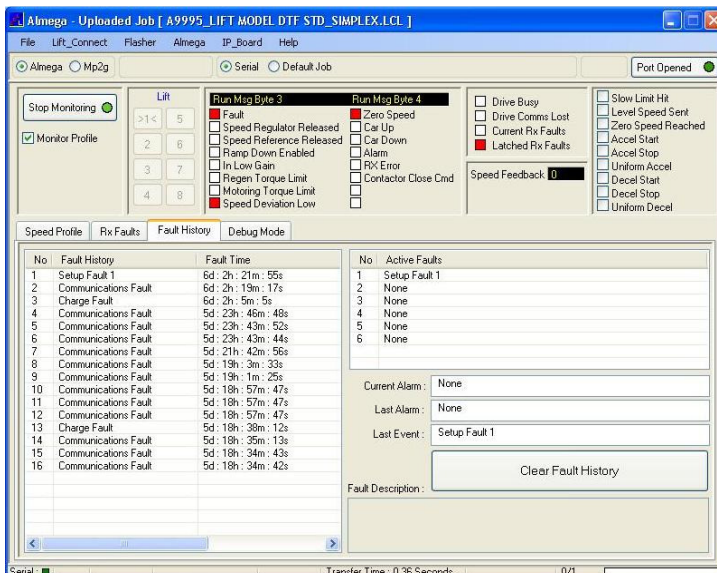
6.1) Profile Viewer
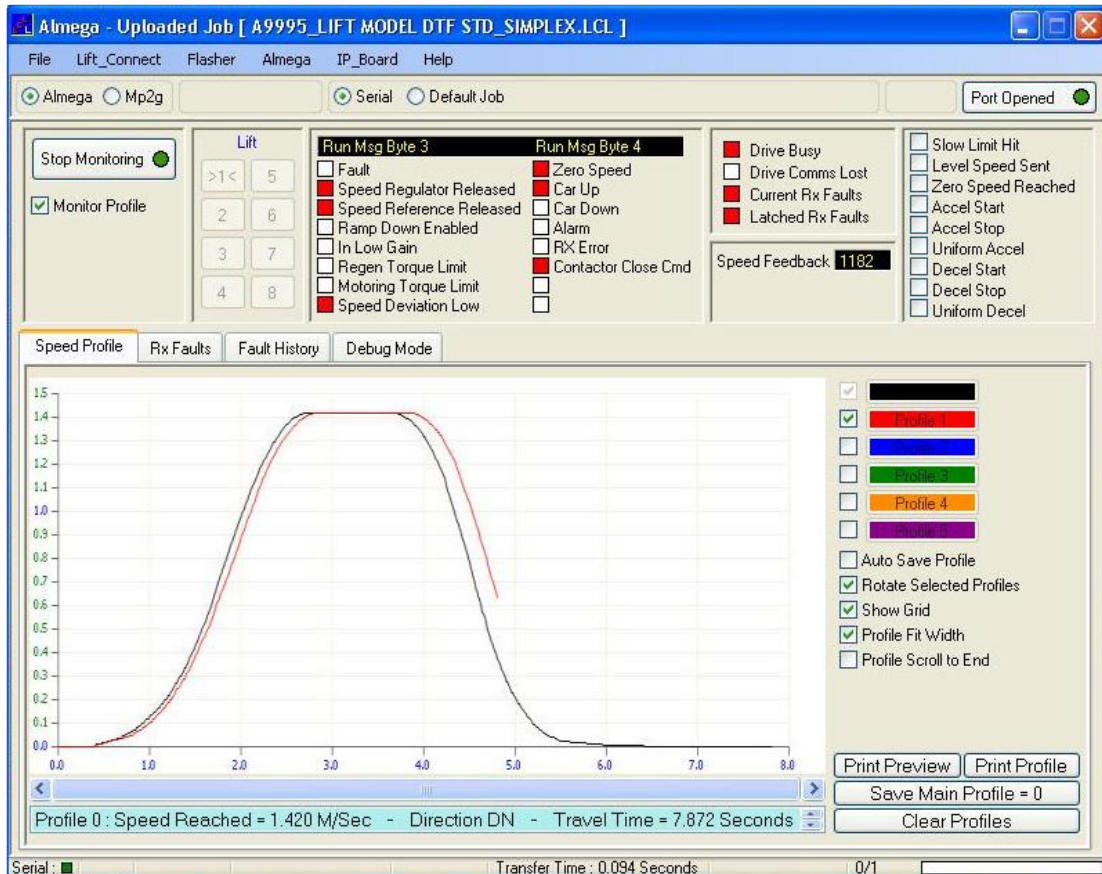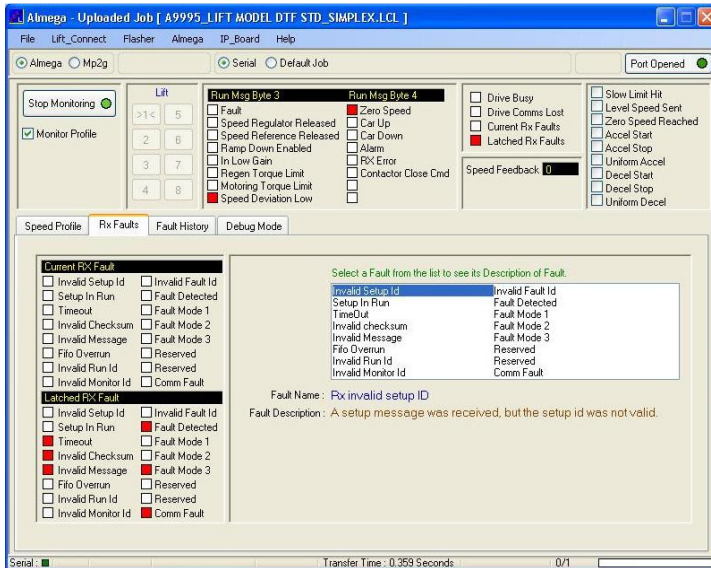
## 6.2) Receive Faults

By selecting the Tab "Rx Faults" a detailed history of drive communication faults can be viewed. Faults are current and latched.

6.3) Fault History

By selecting the Tab "Fault History" a detailed history of drive faults can be viewed. By using the Fault time, events that have occurred may be traced to a certain period. Also there a list of active faults, current and last alarms.
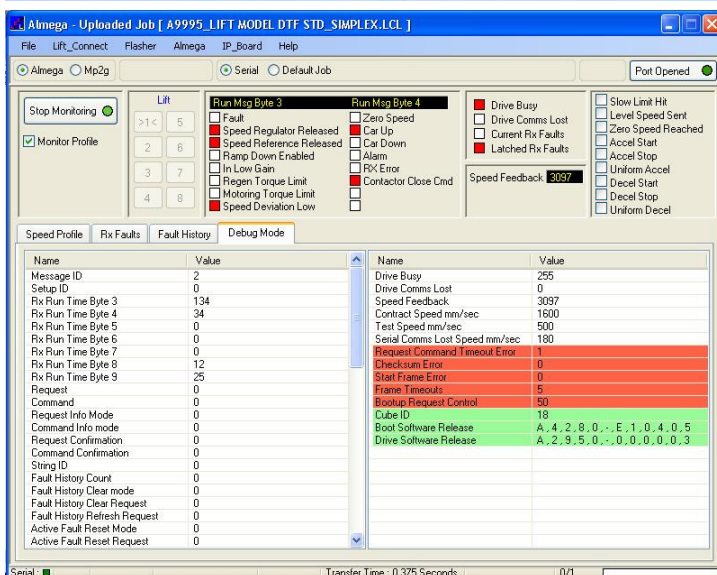
6.4) Debug Mode

By selecting the Tab "Debug Mode" detailed information and history of the Almega transfer interface can be viewed. The Almega interface shows the drive information (i.e. software and Cube ID etc). It also shows any communication errors that may have occurred.