International
Lift Equipment

Technical manual for the Omron 3G3FV flux vector inverter

(closed loop operation with Interflite software control)

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SECTION A

Introduction

The ILE Flux Vector Control inverter for squirrel cage motors utilises state of the art electronics, to control an AC Induction Motor's speed and torque, full current vector control based on advanced control logic can be achieved. In a lift application without the need of a speed feedback element up to 1.0 m/s, and utilising encoder feedback from 1.1 m/s and above.

An accurate motor model is calculated from measurements of the motor voltage and motor current.

THEREFORE WITH CLOSED LOOP FLUX VECTOR OPERATION, A TUNING RUN MUST BE PERFORMED OFF LOAD.

The system enhances single speed lifts with variable speed performance for new and existing lifts, whilst decreasing wasteful heat loss within the motor typical of Variable Voltage Thyristor Controlled regulator systems.

This manual will hopefully give a summarised version of the Omron control options and assist in setting up.
Further, more detailed, information is available in the Omron 3G3FV programming and installation manual. We suggest that, for a first time user, this information is studied.

SECTION B

Sequence of Events

Starting

Starting is initiated by the receipt of either an UP or a DOWN direction signal. Acknowledgement of the direction signal, is fed back to the processor, via the inverter's RUN contact in the STR feedback line. The direction relays, also energise the STR relay, which pulls in the MC contactors that allow power to reach the motor. The OP2 output then energises the BKC relay that lifts the mechanical brake and completes the STR feedback input on the processor board, the speed signals are then given to the drive via the processor outputs OP6, 7, 8. The speed inputs follow the OP2 output after an interval adjustable via the BL rotary switch on the IFIODTC board. This switch is normally set to (1). This function is to aid a smooth start by allowing the regulator to hold the load of the lift electrically before starting the journey. The lift then accelerates to high speed (or any other pre-selected speed).
The READY contact in the BKC line is energised when the inverter is in operational status. The FLT contact is a fault contact, which is energised when there is a fault condition on the inverter.

Stopping

Consider the lift is travelling at high speed. On receipt of a slowing signal the high speed signal OP6 is removed from the regulator. The lift decelerates, and targets for levelling speed, under the influence of the deceleration and scrv parameters until levelling speed is achieved. Upon reaching the stopping zone, MSU and MSD operate, either directly into the microprocessor board, or via relays, this removes OP8. The following sequence then occurs: -

a) The regulator decelerates towards zero speed

b) The mechanical brake is activated by OP2, this time is adjustable via the rotary switch BR on the IF10 DTC to give a smooth stop.

c) The OP3 run signal then drops 0.5 seconds after OP2 cutting off the transistors in the inverter via terminal which is configured as a baseblock.

c) Two seconds later the STR timed contact releases the MC and MC1 contactors, removing the 3 phase from the motor. The OP1 contact on the IFIO DTC acts as a safety backup and will release after 2 seconds. This delay allows the current on both the contactor contacts and regulator transistors to decay to zero before switching. This sequence of events allows a smooth stop and prolongs both contactor and transistor life expectancy.

SECTION C.

Input and output connections

The following is a list of the interflite outputs that interface with the inverter: -

Output	Description
OP3	Run command, Baseblock NO
OP4	Multi-accel/decel time2 enable
OP6	Multi-step speed reference 3
OP7	Multi-step speed reference 2
OP8	Multi-step speed reference 1

The following is a list of the inverter inputs: -

Terminal	Description
1	Down enable
2	Up enable
3	Multi-accel/decel time2 select
5	Multi-step speed reference 1
6	Multi-step speed reference 2
7	Multi-step speed reference 3
8	Baseblock (normally closed, when open circuit the transistors are switched off)
11	Common feed

Terminal 7	6	5	Speed	Speed Reference	
0	0	0	0rpm	d1-01	Frequency ref1
0	0	1	Levelling speed	d1-02	Frequency ref2
0	1	0	0rpm	d1-03	Frequency ref3
0	1	1	Test speed	d1-04	Frequency ref4
1	0	0	0rpm	d1-05	Frequency ref5
1	0	1	High speed	d1-06	Frequency ref6
1	1	0	Medium speed	d1-07	Frequency ref7
1	1	1	0rpm	d1-08	Frequency ref8

The following is a list of tacho card connections: -

Terminal	Description
1	12V supply
2	0V
3	A pulse
4	0V
5	B pulse
6	0V

SECTION D

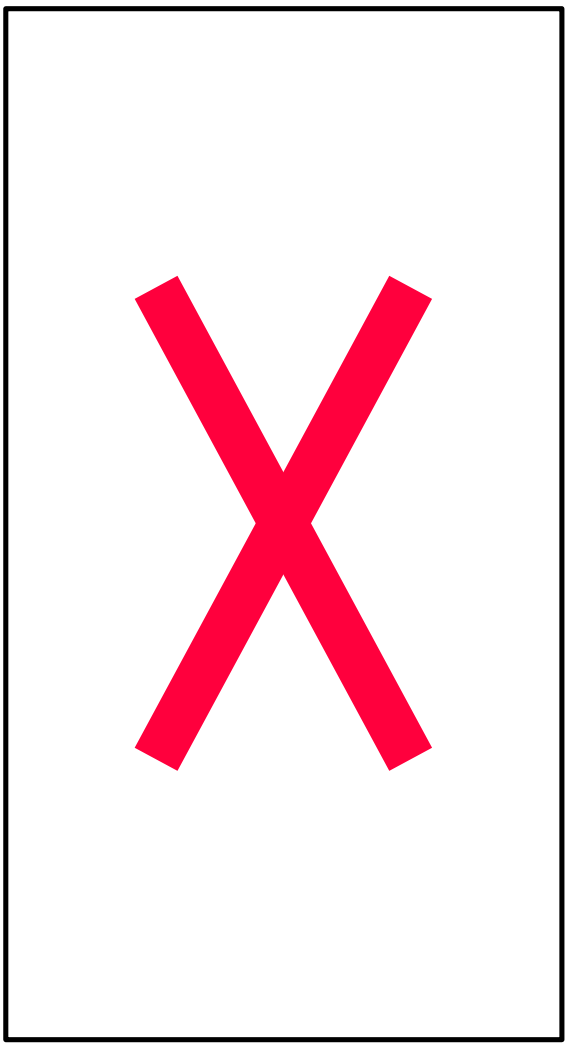
Control panel

The removable keypad is the device used for controlling and programming the Omron 3G3FV. The control panel has 11 keys and the display has 2 lines. The Control Panel can be attached directly to the inverter or it can be mounted externally. To change a parameter enter the group the parameter you wish to change is in, then move to the desired parameter and press the enter key, the far left hand unit will flash and by pressing the reset key you can move along the units to the one you wish to change the value of, then by using the arrow keys the value can be adjusted to the new value required, then press the enter button again to enter the new value and entry accepted will be displayed.

Menu button

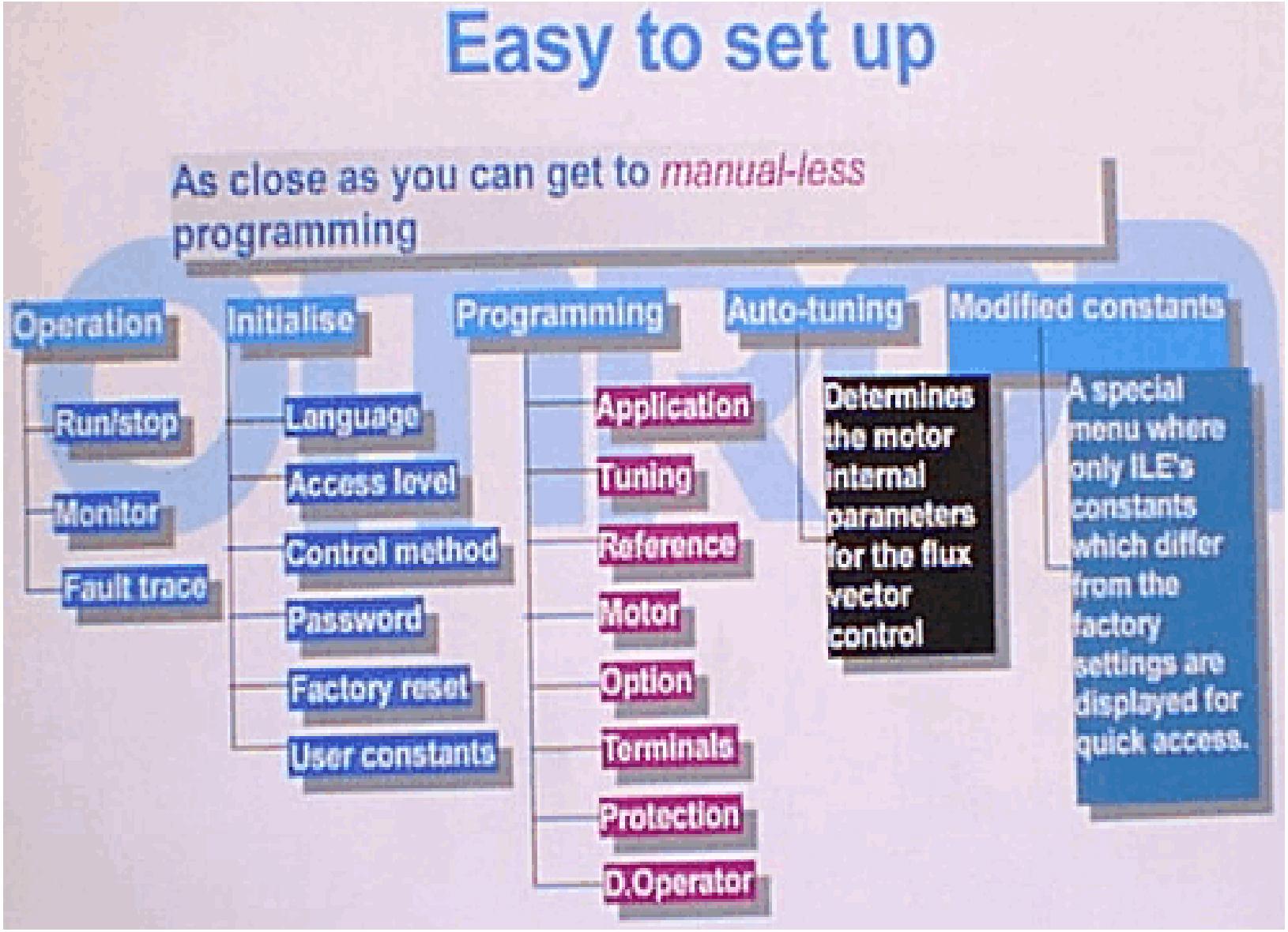
Up arrow

Enter button



The following is the sequence of events for changing the access level and then how to enter the programming mode.

To enter the programming section, programming is selected from the menu and then you can step through the groups and enter the one you want to access.


Easy to set up
As close as you can get to manual-less programming
Operation
Run/stop
Monitor
Fault trace
Initialise
Language
Access level
Control method
Password
Factory reset
User constants
Programming
Application
Tuning
Reference
Motor
Option
Terminals
Protection
O.Operator
Auto-tuning
Determines the motor internal parameters for the flux vector control
Modified constants
A special menu where only ILE's constants which differ from the factory settings are displayed for quick access.

SECTION E

Parameters and description

COMPLETE PARAMETER SETTINGS

The following table is the list of all the default parameter settings for the Omron inverter. Use these tables as reference when you are customising macros for your Omron application. The modified constants section at the end of the manual is a list of all the parameters that have been changed from this default list for each individual application.

Key: -
(D) Shows this parameter stays as factory default and there is no need to modify it
(Varies) This parameter can vary according to drive size the if needed it can be found in the Omron programming manual.
(User set)This shows the parameter is set according to the motor data plate.

PARAMETERS		FACTORY SETTING	UNIT
INITIALISE			
A:-			
1.00	**LANGUAGE**	English	1
1.01	**CONSTANT ACCESS LEVEL**	Advanced	2
1.02	**INITIALIZE PARAMETERS**	No initialise	0
1.03	**CONTROL METHOD**	Open loop vector	2
1.04	**ENTER PASSWORD**	0000	
1.05	**SELECT PASSWORD**	No	0
PROGRAMMING			
B:-	**APPLICATIONS**		
1.00	**SEQUENCE**		
1.01	REFERENCE SOURCE	Terminals	1
1.02	RUN SOURCE	Terminals (D)	1
1.03	STOPPING METHOD	Ramp to Stop (D)	0
1.04	REVERSE OPER	Enabled (D)	0
1.05	ZERO SPEED OPER	Run at Freq Ref (D)	0
1.06	CNTL INPUT SCAN	5ms-2scans (D)	1
1.07	LOC/REM RUN SEL	Cycle ext Run (D)	0
2.00	**DC BRAKING**		
2.01	DC INJ START FREQ	0.5	
2.02	DC INJ CURRENT	50%	
2.03	DC INJ TIME @ START	0.0(D)	
2.04	DC INJ TIME @ STOP	0.5	

PARAMETERS		FACTORY SETTING	UNIT
3.00	**SPEED SEARCH**		
3.01	SPDSRCH AT START	Enabled (D)	1
4.00	**DELAY TIMERS**		
4.01	DELAY-ON TIMER	0.0(D)	
4.02	DELAY-OFF TIMER	0.0(D)	
5.00	**PID CONTROL**		
5.01	PID MODE	Disabled (D)	0
5.02	PID GAIN	1 (D)	
5.03	PID I TIME	1 (D)	
5.04	PID I LIMIT	100 (D)	
5.05	PID D TIME	0 (D)	
5.06	PID LIMIT	100	
5.07	PID OFFSET	0(D)	
5.08	PID DELAY TIME	0(D)	
6.00	**REFERENCE HOLD**		
6.01	DWELL REF @ START	0 (D)	
6.02	DWELL TIME @ START	0 (D)	
6.03	DWELL REF @ STOP	0(D)	
6.04	DWELL TIME @ STOP	0 (D)	
7.00	**DROOP CONTROL**		
7.01	DROOP QUANTITY	0 (D)	
7.02	DROOP DELAY TIME	0.05 (D)	
9.00	**ZERO SERVO**		
9.01	ZERO SERVO GAIN	5 (D)	
9.02	ZERO SERVO COUNT	10 (D)	
C:-	**TUNING**		
1.00	**ACCEL/DECEL**		
1.01	ACCEL TIME 1	10	
1.02	DECEL TIME 1	10	
1.03	ACCEL TIME 2	10 (D)	
1.04	DECEL TIME 2	10 (D)	
1.05	ACCEL TIME 3	10	
1.06	DECEL TIME 3	10	
1.07	ACCEL TIME 4	10 (D)	
1.08	DECEL TIME 4	10 (D)	
1.09	FAST STOP TIME	10 (D)	
1.10	ACC/DEC UNITS	0.1(D)	
1.11	ACC/DEC SW FREQ	0 (D)	
2.00	**S-CURVE ACC/DEC**		
2.01	SCRV ACC @ START	0.2	
2.02	SCRV ACC @ END	0.2	
2.03	SCRV DEC @ START	0.2	
2.04	SCRV DEC @ END	0.0	

PARAMETERS		FACTORY SETTING	UNIT
3.00	**MOTOR COMP SLIP**		
3.01	SLIP COMP GAIN	1.0	
5.00	**ASR TUNING**		
5.01	ASR P GAIN 1	20 (D)	
5.02	ASR I TIME 1	0.5 (D)	
5.03	ASR P GAIN 2	20 (D)	
5.04	ASR I TIME 2	0.5 (D)	
5.06	ASR DELAY TIME	0.004 (D)	
5.07	ASR GAIN SW FREQ	0 (D)	
5.08	ASR I LIMIT	400 (D)	
6.00	**CARRIER FREQ**		
6.01	CARRIER FREQ MAX	15 (D)	(Varies)
8.00	**FACTORY TUNING**		
8.30	Carrier in tune	0	

D:- REFERENCE

1.00	**PRESET REFERENCE**		
1.01	REFERENCE 1	0 (D)	
1.02	REFERENCE 2	0	
1.03	REFERENCE 3	0 (D)	
1.04	REFERENCE 4	0	
1.05	REFERENCE 5	0 (D)	
1.06	REFERENCE 6	0	
1.07	REFERENCE 7	0	
1.08	REFERENCE 8	0 (D)	
1.09	JOG REFERENCE	6.0 (D)	
2.00	**REFERENCE LIMITS**		
2.01	REF UPPER LIMIT	100 (D)	
2.02	REF LOWER LIMIT	0 (D)	
3.00	**JUMP FREQUENCIES**		
3.01	JUMP FREQ 1	0 (D)	
3.02	JUMP FREQ 2	0 (D)	
3.03	JUMP FREQ 3	0 (D)	
3.04	JUMP BANDWIDTH	1.0 (D)	
4.00	**SEQUENCE**		
4.01	MOP REF MEMORY	0 (D)	
4.02	TRIM CONTROLLVL	25 (D)	

PARAMETERS		FACTORY SETTING	UNIT
5.00	**TORQUE CONTROL**		
5.01	TORQ CONTROL SEL	0 (D)	
5.02	TORQ REF FILTER	0 (D)	
5.03	SPEED LIMIT SEL	1 (D)	
5.04	SPEED LMT VALUE	0 (D)	
5.05	SPEED LMT BIAS	10 (D)	
5.06	REF HOLD TIME	0 (D)	
E:-	**MOTOR**		
1.00	**V/F PATTERN**		
1.01	INPUT VOLTAGE	400	
1.02	MOTOR SELECTION	Standard fan cooled (D)	0
1.03	V/F SELECTION	Custom ser-set patterns (D)	F
1.04	MAX FREQUENCY	50 (D)	
1.05	MAX VOLTAGE	400	
1.06	BASE FREQUENCY	60	(User set)
1.09	MIN FREQUENCY	0.0 (D)	(Auto tuned)
1.11	MID FREQUENCY B	0.0 (D)	(Auto tuned)
1.12	MID VOLTAGE B	0.0 (D)	(Auto tuned)
1.13	BASE VOLTAGE	0.0	(User set)
2.00	**MOTOR SETUP**		
2.01	MOTOR RATED FLA	31	(User set)
2.02	MOTOR RATED SLIP	2.5	(User set)
2.03	NO LOAD CURRENT	14 (D)	(Auto tuned)
2.04	NUMBER OF POLES	4	(User set)
2.05	TERM RESISTANCE	10.1 (D)	(Auto tuned)
2.06	LEAK INDUCTANCE	18.3 (D)	(Auto tuned)
2.07	SATURATION COMP 1	0.5 (D)	(Auto tuned)
2.08	SATURATION COMP 2	0.75 (D)	(Auto tuned)
2.09	MECHANICAL LOSS	0 (D)	
3.00	**MOTOR 2 CTL METH**		
3.01	CONTROL METHOD	2 (D)	
4.00	**V/F PATTERN 2**		
4.01	V/F 2 MAX FREQ	60 (D)	
4.02	V/F 2 MAX VOLTAGE	400 (D)	
4.03	V/F 2 BASE FREQ	60 (D)	
4.06	V/F 2 MIN FREQ	0.4 (D)	

PARAMETERS		FACTORY SETTING	UNIT
5.00	**MOTOR 2 SETUP**		
5.01	MOTOR 2 RATED FLA	N/A	
5.02	MOTOR 2 SLIP FREQ	N/A	
5.03	MOTOR 2 NO-LOAD 1	N/A	
5.04	MOTOR 2 # POLES	N/A	
5.05	MOTOR 2 TERM OHMS	N/A	
5.06	MOTOR 2 LEAK	N/A	
F:-	**OPTIONS**		
1.00	**PG OPTION SETUP**		
1.01	PG PULSE/REV	1024 (D)	
1.02	PG FDBK LOSS SEL	Coast to stop (D)	1
1.03	PG OVERSPEED SEL	Coast to stop (D)	1
1.04	PG DEVIATION SEL	Continue operation	3
1.05	PG ROTATION SEL	Phase A leads with for (D)	0
1.06	PG OUTPUT RATIO	1 (D)	
1.08	PG OVERSPD LEVEL	115 (D)	
1.09	PG OVERSPD TIME	0 (D)	
1.10	PG DEVIATE LEVEL	10 (D)	
1.11	PG DEVIATE TIME	0.5 (D)	
1.14	PGO TIME	2 (D)	
2.00	**AI-14 SETUP**		
2.01	AI-14 INPUT SEL	3 channel individual (D)	0
3.00	**DI-08, 16 SETUP**		
3.01	PDI-08/PDI16H SET UP	BCD 1% unit (D)	0
4.00	**AO-08, 12 SETUP**		
4.01	A0 CH1 SELECT	2 (D)	
4.02	A0 CH1 GAIN	1 (D)	
4.03	A0 CH2 SELECT	3 (D)	
4.04	A0 CH2 GAIN	0.5 (D)	
5.00	**DO-02 SETUP**		
5.01	RELAY OUTPUT (DO-02 CH1 SELECT)	0(D)	
5.02	RELAY OUTPUT (DO-02 CH2 SELECT)	1(D)	
6.00	**DO-08 SETUP**		
6.01	DIGITAL OUTPUT CARD	0 (D)	
7.00	**PO-36F SETUP**		
7.01	PPO-36F PULSE OUTPUT SETUP	1(D)	
8.00			
8.01	E-15 DET SEL	1 (D)	

PARAMETERS		FACTORY SETTING	UNIT
9.00	**EFO SETUP**		
9.01	EFO SELECTION	0 (D)	
9.02	FO DTCT SEL	0 (D)	
9.03	EFO FAULT SEL	1 (D)	
9.04	TRACE SAMPLE TIM	0 (D)	
H:-	**TERMINALS**		
1.00	**DIGITAL INPUTS**		
1.01	TERMINAL 3 SEL	External fault	24
1.02	TERMINAL 4 SEL	Fault reset	14
1.03	TERMINAL 5 SEL	Multi-step speed ref 1 (D)	3
1.04	TERMINAL 6 SEL	Multi-step speed ref 2 (D)	4
1.05	TERMINAL 7 SEL	Jog frequency ref	6
1.06	TERMINAL 8 SEL	Baseblock NO	8
2.00	**DIGITAL OUTPUTS**		
2.01	TERMINAL 9-10	During run 1	0
2.02	TERMINAL 25-27	Excitation	1
2.03	TERMINAL 26-27	Frequency agree 1 (D)	2
3.00	**ANALOGUE INPUTS**		
3.01	TERM 13 SIGNAL	0 (D)	
3.02	TERM 13 GAIN	100 (D)	
3.03	TERM 13 BIAS	0 (D)	
3.04	TERM 16 SIGNAL	0 (D)	
3.05	TERM 16 SEL	Auxiliary frequency reference	0
3.06	TERM 16 GAIN	100 (D)	
3.07	TERM 16 BIAS	0 (D)	
3.08	TERM 14 SIGNAL	2 (D)	
3.09	TERM 14 SEL	Not used (D)	1F
3.10	TERM 14 GAIN	100 (D)	
3.11	TERM 14 BIAS	0 (D)	
3.12	FILTER AVG TIME	0 (D)	
4.00	**ANALOG OUTPUTS**		
4.01	TERMINAL 21 SEL	2 (D)	
4.02	TERMINAL 21 GAIN	1 (D)	
4.03	TERMINAL 21 BIAS	0 (D)	
4.04	TERMINAL 23 SEL	3 (D)	
4.05	TERMINAL 23 GAIN	0.5 (D)	
4.06	TERMINAL 23 BIAS	0 (D)	
4.07	AO LEVEL SELECT	0 (D)	

PARAMETERS			FACTORY SETTING	UNIT
5.00	**SERIAL COM SETUP**			
5.01	SERIAL COMM ADR		1F (D)	
5.02	SERIAL BAUD RATE		3 (D)	
5.03	SERIAL COM SEL		0 (D)	
5.04	SERIAL FAULT SEL	3 (D)		
5.05	SERIAL FLT DTCT		1 (D)	
L:-	**PROTECTION**			
1.00	**MOTOR OVERLOAD PROTECTION**			
1.01	MOL FAULT SEL		Enabled (D)	1
1.02	MOL TIME CONST		1.0	
2.00	**POWER LOSS RIDE-THROUGH PARAMETERS**			
2.01	PWRL SELECTION		0 (D)	
2.02	PWRL RIDETHRU T	1 (D)		(Varies)
2.03	PWRL BASEBLOCK T		0.5 (D)	(Varies)
2.04	PWRL V/F RAMP T		0.3 (D)	
2.05	PUV DET LEVEL		380 (D)	
2.06	KEB FREQUENCY		0 (D)	
3.00	**STALL PREVENTION**			
3.04	STALLP DECEL SEL		Enabled	1
4.00	**SPEED/FREQUENCY DETECTION**			
4.01	SPD AGREE LEVEL		0 (D)	
4.02	SPD AGREE WIDTH	2 (D)		
4.03	SPD AGREE LEVEL+/-		0 (D)	
4.04	SPD AGREE WIDTH +/-		2 (D)	
4.05	REF LOSS SEL		0 (D)	
5.00	**FAULT RESET/RESTART**			
5.01	NUM OF RESTARTS		0 (D)	
5.02	RESTART SEL		Not active	0
6.00	**OVERTORQUE DETECTION**			
6.01	TORQ DET 1 SEL		Disabled	0
6.02	TORQ DET 1 LVL		150 (D)	
6.03	TORQ DET 1 TIME		0.1	
6.04	TORQ DET 2 SEL		Disabled (D)	0
6.05	TORQ DET 2 LVL		150 (D)	
6.06	TORQ DET 2 TIME		0.1 (D)	
7.00	**TORQUE LIMITS**			
7.01	TORQ LIMIT FWD		200(D)	
7.02	TORQ LIMIT REV		200(D)	
7.03	TORQ LMT FWD RGN		200(D)	
7.04	TORQ LMT REV RGN		200(D)	

PARAMETERS		FACTORY SETTING	UNIT
8.00	**HARDWARE PROTECTION**		
8.01	DB RESIST PROT	Disabled (D)	0
8.02	OH PRE-ALARM LVL	95 (D)	
8.03	OH PRE-ALARM SEL	Continue operation	3
8.05	PH LOSS IN SEL	Disabled	0
8.07	PH LOSS OUT SEL	Disabled	0
8.10	GF FAULT SEL	Enabled (D)	1
O:-	**OPERATOR**		
1.00	**DISPLAY SELECTION**		
1.01	MONITOR SELECT	6 (D)	
1.02	POWER-ON MONITOR	Frequency reference (D)	1
1.03	DISPLAY SCALING	0 (D)	
1.04	DISPLAY UNIT	0 (D)	
1.05	ADDRESS DISPLAY	0 (D)	
2.00	**OPERATOR KEY FUNCTION SELECTION**		
2.01	LOCAL/REMOTE KEY	Enabled (D)	1
2.02	OPERATOR STOP KEY	Enabled (D)	1
2.03	USER DEFAULT	Store not set (D)	0
2.04	INVERTER MODEL #	22 (D)	(Varies)
2.05	OPERATOR M.O.P	Enter key needed (D)	0
2.06	OPER DETECTION	Disabled (D)	0
2.07	ELAPSED TIME SET	0 (D)	
2.08	ELAPSED TIME RUN	Cumulative power on (D)	0
2.09	INIT MODE SEL	2 (D)	

SECTION F

Monitoring

The following describes the Monitoring Signals. To put the Omron inverter in the ready to run state whereby the unit is controlled by the ILE controller the MENU button is pressed and 'MAIN MENU OPERATION' is displayed then the ENTER button is pressed. The monitoring section is entered by pressing the up arrow until you come to FUNCTION U1 MONITOR then press the enter button to enter this mode.

U1-05 SPEED	Displays the actual speed of the motor, as calculated by the inverter. The speed is displayed in Hz.
U1-02 FREQUENCY	Displays the output frequency (Hz) applied to the motor, as calculated by the inverter.
U1-03 CURRENT	Displays the motor current, as measured by the inverter.
U1-09 TORQUE	Displays the motor torque in per cent of the rated motor torque, as calculated by the inverter.
U1-08 POWER	Displays the motor power.
U1-07 DC BUS VOLTAGE V	Displays the DC bus voltage, as measured in the inverter. The voltage is displayed in Volts DC.
U1-06 OUTPUT VOLTAGE	Displays the motor voltage, as calculated by the inverter.
U1-13 OP HOUR COUNTER	This Actual Signal is an elapsed-time indicator. It counts the time the inverter has an Enable signal and a Start command, and is not in a fault state. The counted time cannot be reset.
U1-10 I/P Terminals	Status of the digital inputs. If the input is energised the display will indicate 1. If the input is not energised, the display will be 0.

U1-11 O/P STATUS	Status of the three outputs. 1 indicates that the O/P is energised and 0 indicates that the O/P is de-energised.

SECTION G

Autotuning

The tuning run requires that the motor is completely off load for best performance, although with a flange mounted motor good performance can be obtained with just the gearbox coupled and the ropes removed.

The tuning run is performed as follows: -

Note : The motor will run independently of any signals received.

1. If the motor is flange mounted then remove the ropes from the traction sheave.

2. If the motor is foot mounted then uncouple the motor from the winding gear, disconnect the brake and ensure the motor is able to run freely.

3. Switch the lift to inspection control and power up the panel.

4. Enter the required motor data in group E.

5. Short out the Overtravel limits if necessary, the safety and lock circuits need to be made. Press the MENU button and then short TUD to DL.

7. The mains contactors should energise but the motor should not run.

8. Step up to the **autotuning** section from the main menu and press the enter key and input the motor parameters from the motor data plate, ie. Rated V, I, F, No. of poles, async. Speed.

9. The display shows, 'Tuning ready? Press RUN key'…. Press the **RUN** key!!

10. When the motor stops rotating and 'Tune Successful' is displayed, remove the link between TUD and DL and return to drive-run mode by pressing **ESC** and **ENTER** button.

11. Try running the motor in both directions using a short from TUD to UL and DL then switch the lift off and remove all shorting links, recouple the motor to the winding gear and reconnect the brake.

SECTION H

Commissioning procedure

N.B Commissioning procedure is to be carried out by competent personnel only.

WARNING : DO NOT TURN POWER ON & OFF MORE THAN 5 TIMES EVERY 15 MINUTES OR INTERNAL COMPONENTS MAY BE DAMAGED !!!

Equipment Required.

1. A Tachometer.

2. An A.C current meter. (Moving coil, not digital)

Pre Switch On Checks.

1. Check all site wiring and mains cable rating are correct.

2. Check the installation is in conformance with the EMC standards.

3. Ensure the lift is counter balanced correctly.

4. Ensure the encoder is fitted correctly aligned and connected to the controller correctly.

5. Ensure the lift doors cannot open (this can be done by switching on DIL switch SP1 and PRPTT).

Speed settings.

NOTE: ALL SPEED SETTINGS ARE IN Hz NOT RPM.

1. Simulate the Test Up button, check the lift runs in the UP Direction on test speed and the UP contactor is energised. If the lift runs DN reverse two of the motor phases and retest.

2. Simulate a Test Dn button and check the lift moves DN at test speed and the speed is the desired value, if not adjust speed D1-04 to suit.

3. Place the lift empty car at the bottom floor, Switch the lift to NORMAL and run the lift UP in high speed, and ensure the lift slows into floor correctly.

4. If the speeds are incorrect adjust the parameters D1-02,6 after the lift has stopped and repeat step 3.

5. Place the lift empty car at the top floor and run the lift DN, ensure the high speed is the

same as the UP direction, if not refer to section I.

6. Check high speed in the UP direction and set to contract speed ensuring the lift slows and levels OK.

7. If the lift overshoots floor level or has a long levelling time into floor then adjust the slowing distance combined with deceleration rate C1-02 and the s cuves C2-03,4 to acquire a reasonable comfort level with a minimum levelling time.

8. The BR, brake release switch on the IFIO board can be adjusted to give a delay on the brake releasing or release it earlier.

9. Place the lift empty car at the top floor and run the lift DN in high speed, ensure when the lift slows the lift levelling speed is equal in the UP and DN direction, if not refer to section I.

SETTING THE ACCELERATION AND STARTING.

1. Run the lift and note the acceleration rate.

2. Adjust the Acceleration rate C1-01 and s-curve C2-01,2 parameters for the desired acceleration that is required.

3. On starting ensure the brake lifts and the lift accelerates towards the desired speed. If the motor
tries to drive against the brake then increase the Brake Lifted (BL) switch.

4. If the lift rolls back decrease the BL switch until the lift just starts to
accelerate as the brake is released.

STALL TEST

1. Disconnect the brake and isolate. Switch the lift to test and switch on the controller.

2. Place the clamp meter on a phase of the incoming mains.

3. Simulate the test up push and the meter should be showing more than 1.75*flc. If the meter is showing 1.75 * flc or more, the regulator trips in the time specified in parameter L6-03. To reset switch the controller off then on.

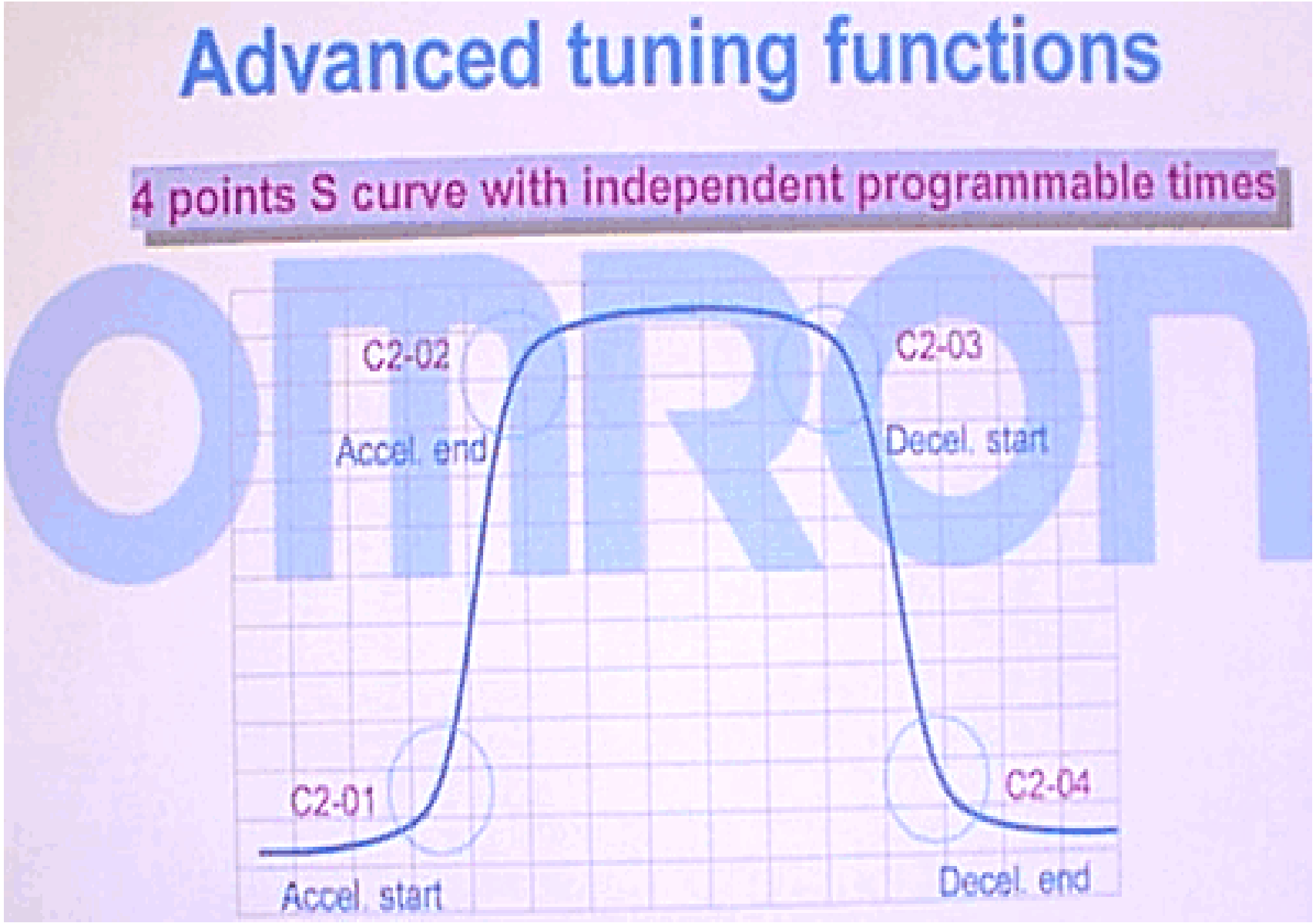
4. Repeat in the DN direction.

5. Reconnect the brake.

N.B. To reset the regulator after a fault press the RESET or switch the panel off for at least 30 sec then on again. After commissioning run the lift for at least 1 hour and ensure floor levels are consistent and the lift performs correctly.

Advanced tuning functions

4 points S curve with independent programmable times



SECTION I

Ride quality adjustments

The following parameters show how the performance of the inverter can be improved to suit individual applications.

Slip Comp Gain C3-01 can be adjusted in steps of 0.1 to equalise the levelling speeds in the up and down direction, there is a desired maximum setting of 2.0 and a minimum setting of 0.5 setting this value too high will lead to vibration.

Motor Rated slip E2-02 can be increased to induce more slip and hence more current.

Increasing the Min / Mid Voltage E1-10 / E1-08 settings will reduce the requirements of slip compensation acting upon output frequency, thus reducing the possibility of speed oscillation. The settings can be adjusted in 5V steps improving the levels of low / medium speed running torque, thereby minimising undershoot.

No-load current E2-03 can also be adjusted for up to 50% of Motor nameplate rated full load current E2-01. This will ensure tighter control under empty car down conditions again minimising undershoot.

SECTION J

Single floor run operation.

Only applicable on speeds above 1mps.

Single floor runs on high speed lifts are accomplished by using a different acceleration and deceleration rate. A single floor run is detected by the Interflite, which selects a medium speed. When the slowing vane is reached OP4 on the IFIODTC board is used to select deceleration rate 2 to slow to levelling speed. Using this different rate ensures that slowing from medium speed is accomplished in the same distance used to slow from high speed.
This system requires no extra limit switches or vanes in the lift shaft.

For normal high speed travel the deceleration is set by the parameter decel time 1, C1-02, as shown in figure 1.

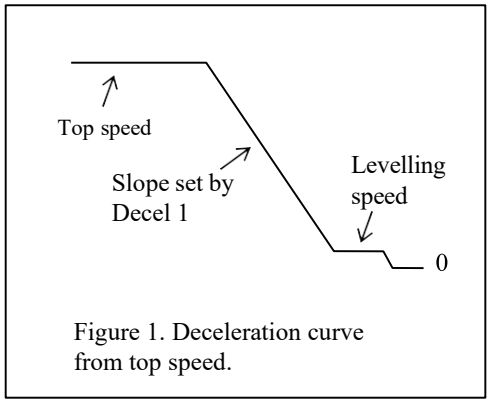


Figure 1. Deceleration curve from top speed.

A single floor run operation uses the decel time 3 parameter C1-06 in the drive to decelerate from a medium speed at a slower than normal rate, as shown in figure 2.

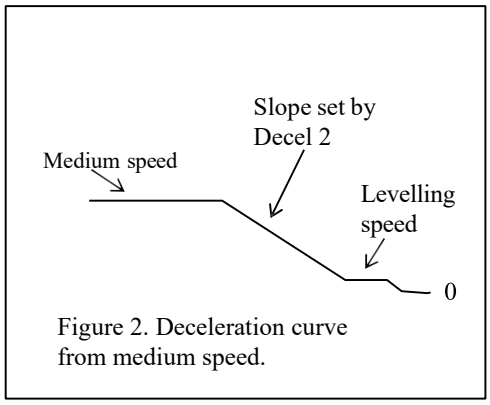


Figure 2. Deceleration curve from medium speed.

If a journey starts as a single floor run but becomes a normal run the accel time 3 parameter allows speed to be gradually increased to full speed. This is shown in figure 3.

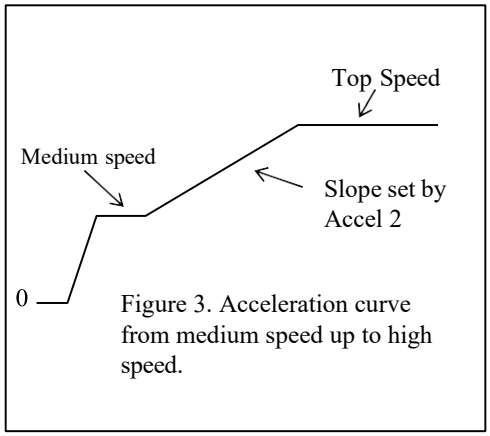


Figure 3. Acceleration curve from medium speed up to high speed.

Setting up procedure for single floor runs.

1. Setting Decel time 3. (parameter C1-05)

1.1. Set up the slowing vanes and floor levels as normal using multi floor runs.
1.2. At the shortest floor set a medium speed (D1-07 frequency reference 7) which can be achieved before the slowing vane on a single floor run.
1.3. Adjust parameter decel time 3 to give the minimum time at levelling speed. Levelling speed must be achieved to ensure consistent levelling.

2. Setting Accel time 3. (parameter C1-05)

2.1 Enter a down landing call at the floor above the current position. When movement has begun enter a car call above the landing call. This will result in an initial acceleration to medium speed. When the PXU vane is reached the speed will be increased to full speed at the rate set by accel time 3. This parameter should be adjusted to ensure that full speed is reached before the next PXU vane, and also ensure a very gentle transition during this second phase of acceleration. Travel will now proceed as normal.

2.2 Repeat the above, with an up landing call below the current position followed by a car call below the landing call, to check operation for travelling down.

SECTION J

Fault Finding

The following section shows the common fault codes with a description of the fault and cause.

SECTION K

Modified constants

The following sheet is a print out of all the parameters that have been changed from the factory default values for this application.