



A1000

High Performance Vector Drive

About us

Larsen & Toubro is a technology-driven USD 8.5 billion company that infuses engineering with imagination. The Company offers a wide range of advanced solutions in the field of Engineering, Construction, Electrical & Automation, Machinery and Information Technology.

L&T Switchgear, which forms part of the Electrical & Automation business, is India's largest manufacturer of low voltage switchgear, with the scale, sophistication and range to meet global benchmarks. With over four decades of experience in this field, the Company today enjoys a leadership position in the Indian market with growing presence in international markets.

It offers a complete range of products including controlgear, powergear, industrial automation, motor starters, energy meters, wires and host of other accessories.

L&T introduces A1000, a high performance vector drive.



Switchgear Factory, Mumbai

A1000 Drive

L&T A1000 Drives with its latest vector control technology is capable of delivering higher order performance to meet customer expectations. A1000, not only performs but is aesthetically superior and incredibly powerful. A truly reliable product to address future requirements & current needs, only possible from L&T.

Features

- **Motor Drive Performance leading the pack**

- Uses most advanced drive technology to run induction and synchronous motors
- Positioning accuracy without use of external sensors
- Excellent torque characteristics
- Loading with new auto-tuning features
- Tackles power loss

- **User Friendly Installation & Delivers Longer Life**

- Easy setup with application presets
- Open to all serial network protocols
- Easy to maintain

- **The Drive for a greener world**

- Saves energy
- Environment friendly

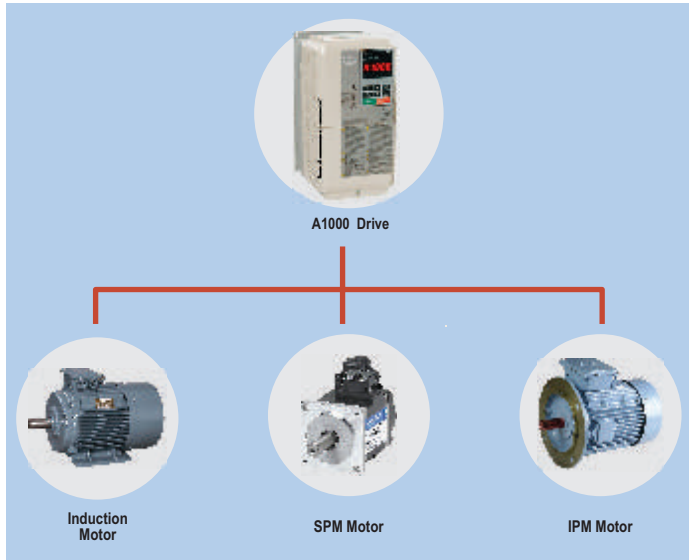


A1000 Drives manufactured by :
Yaskawa Electric Corporation
JAPAN

Motor Drive Performance Leading the Pack

The Most Advanced Drive Technology

A1000 runs both induction motors and synchronous motors.



Excellent Speed Range



Synchronous Motor

- Advanced Open Loop Vector Control for PM
200% rated torque at 0 r/min, speed range of 1:100
- Closed Loop Vector Control for PM
200% rated torque at 0 r/min, speed range of 1:1500



Induction Motor

- Open Loop Vector Control
200% rated torque at 0.3 Hz, speed range of 1:200
- Closed Loop Vector Control
200% rated torque at 0 r/min, speed range of 1:1500

Loaded with Auto-Tuning Features



Tuning the motor

Rotational Auto-Tuning	Applications requiring high starting torque, high speed and high accuracy.
Stationary Auto-Tuning	Application where the motor must remain connected to the load during the tuning process.
Line-to-Line Resistance Auto-Tuning	For motor and drive has changed, or when motor and drive capacity ratings differ.
Energy-Saving Auto-Tuning	For running the motor at highest efficiency all the time.



Tuning the Load

Inertia Tuning	Optimizes the drive's ability to decelerate the load. Useful for application using KEB and Feed Forward function.
ASR Gain Auto-Tuning Automatic Speed Regulator	Automatically adjusts ASR gain to better match the frequency reference.

Variety of Braking Functions

- Built-in Braking Chopper upto 30kW(HD) Drives
- Overexciting Deceleration for immediate stop without braking resistor

Enhanced Features

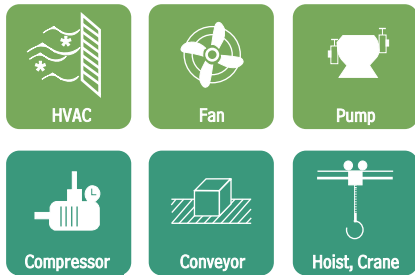
- No deration required upto 50 deg C
- Swing PWM reduces electromagnetic noise
- Records last 10 faults
- Intelligent terminal block
- Pulse output for continuous watt-hour monitoring

Application Oriented Drive - Get > Set > Go !

Easy Setup

- Immediate setup with Application Presets

A1000 automatically sets parameters needed for all major applications. Simply selecting the appropriate application instantly optimizes the drive for top performance, saving enormous time, setting up for a trial run.



- Example using Application Presets

Selecting "Conveyor" optimizes five parameter settings so that drive is ready to start running your conveyor application immediately.



Setting	Application	Parameters are programmed automatically
00	General-purpose	
01	Water Supply Pump	A1-02 Control mode selection
02	Conveyor	C1-01 Accel Time1
03	Exhaust Fan	C1-02 Decel Time 1
04	HVAC Fan	C6-01 ND/HD Selection
05	Air Compressors	
06	Crane (Hoist)	
07	Crane (Traverse)	

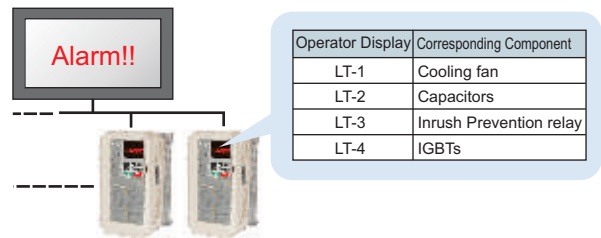
Open to all Serial Network Protocols

- RS-422/485 (Memobus/Modbus at 115.2 kbps) standard on all models
- Option cards available for all major serial networks used across the globe: Profibus-DP, DeviceNet, CC-Link, CAN open, Mechatro-Link-II, among others
- Less wiring and space-saving features help in easy installation and maintenance

Long Life Performance

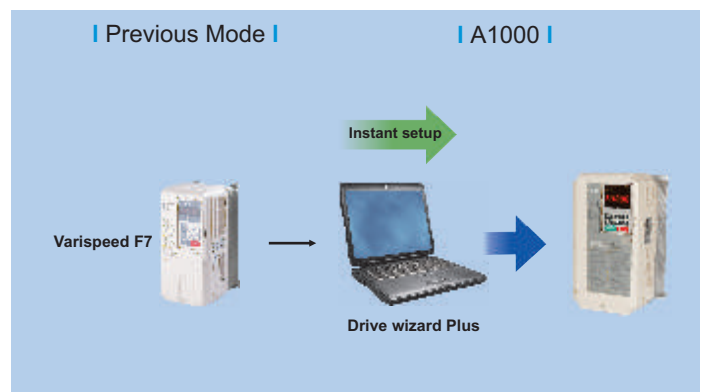
A1000 with 10 years of durable performance

- Motor Life
With relatively low copper loss in the rotor and a cool shaft during operation, synchronous motors have a bearing life twice that of induction motors
- Performance Life Monitors
Equipped with performance life monitors that notify the user of part wear and maintenance periods to prevent problems before they occur
- Drive outputs a signal to the control device indicating components that may need replacement




Engineering Tool Drive Wizard Plus

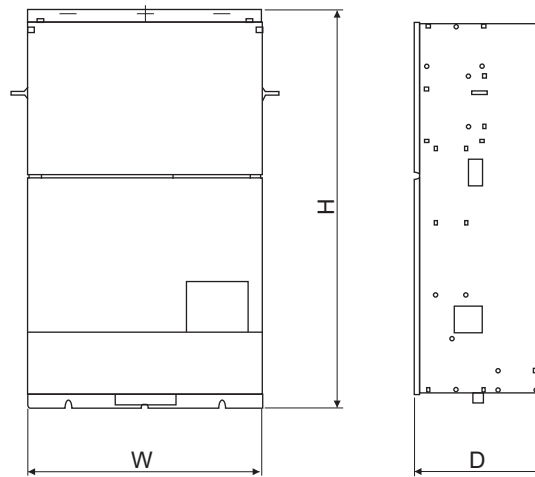
- Manage the unique settings for all your drives right on your PC
- An indispensable tool for drive setup and maintenance; Edit parameters, access all monitors, create customized operation sequences, and observe drive performance with the oscilloscope function
- The drive replacement feature in Drive Wizard Plus saves valuable time during equipment replacement and application upgrades by converting previous product parameter values to the new A1000 parameters automatically
- Drive replacement function



A1000 Specifications

		0002	0004	0005	0007	0011	0018	0023	0031	0038	0044	0058	0072	0088	0103	0139	0165	0208	0250	0296	0362	0414	0515	0675	
Standard Specifications	Model CIMR-AD4A □□□□																								
	Typical Motor Capacity	Normal Duty	0.75	1.5	2.2	3	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	250	355
		Heavy Duty	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	315
	Rated Output Capacity in KVA	Normal Duty	1.6	3.1	4.1	5.3	8.5	13.3	17.5	24	29	34	44	55	67	78	106	126	159	191	226	276	316	392	514
		Heavy Duty	1.4	2.6	3.7	4.2	7	11.3	13.7	18.3	24	30	34	46	57	69	85	114	137	165	198	232	282	343	461
	Rated Output Current A	Normal Duty	2.1	4.1	5.4	6.9	11.1	17.5	23	31	38	44	58	72	88	103	139	165	208	250	296	362	414	515	675
		Heavy Duty	1.8	3.4	4.8	5.5	9.2	14.8	18	24	31	39	45	60	75	91	112	150	180	216	260	304	370	450	605
	Enclosure Type	NEMA-1 (can be used as IP00 by removing top & bottom covers)																		IP00					
	Overload Tolerance	Normal Duty Rating: 120% of rated output current for 60 s												Heavy Duty Rating: 150% of rated output current for 60s											
	Max. Output Voltage	Proportional to input voltage																							
Max. Output Frequency	400 Hz																								
Rated Voltage / Rated Frequency	Three-phase 380 to 480 VAC, 50/60 Hz,																								
Allowable Voltage Fluctuation	-15% to +10%																								
Allowable Frequency Fluctuation	±5%																								
Harmonic Suppression	DC Reactor	Option												Built-in											
Braking Function	Braking Chopper	Built-in												Option											
Control Characteristics	Control Method	V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control with PG, Open Loop Vector Control for PM, Advanced Open Loop Vector Control for PM, Closed Loop Vector Control for PM																							
	Frequency Control Range	0.01 to 400 Hz																							
	Frequency Setting Resolution	Digital reference: 0.01 Hz Analog reference: 0.03 Hz / 60 Hz (11 bit)																							
	Output Frequency Resolution	0.001 Hz																							
	Frequency Setting Signal	-10 to +10 V, 0 to +10 V, 4 to 20 mA, pulse train																							
	Starting Torque	150%/3 Hz (V/f Control and V/f Control with PG), 200%/0.3 Hz (Open Loop Vector Control), 200%/0 RPM (Closed Loop Vector Control, Closed Loop Vector Control for PM, and Advanced Open Loop Vector Control for PM), 100%/5% speed (Open Loop Vector Control for PM)																							
	Speed Control Range	1:1500 (Closed Loop Vector Control and Closed Loop Vector Control for PM) 1:200 (Open Loop Vector Control) 1:40 (V/f Control and V/f Control with PG) 1:20 (Open Loop Vector Control for PM) 1:100 (Advanced Open Loop Vector Control for PM)																							
	Speed Control Accuracy	±0.2% in Open Loop Vector Control (25°C ±10°C), ±0.02% in Closed Loop Vector Control (25°C ±10°C)																							
	Speed Response	10 Hz in Open Loop Vector Control (25°C ±10°C), 50 Hz in Closed Loop Vector Control (25°C ±10°C) (excludes temperature fluctuation when performing Rotational Auto Tuning)																							
	Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)																							
Braking Torque	Drives of 200/400V 30kW (ND) or less have a built-in braking transistor (Over excitation Deceleration, High Slip Braking: approx. 40%) Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option: 10% ED, 10 s, internal braking transistor)																								
V/f Characteristics	User-selected programs and V/f preset patterns possible																								
Main Control Functions	Torque Control, Droop Control, Speed/Torque Control switch, Feed Forward Control, Zero Servo Control, Momentary, Power Loss Ride-Thru, Speed Search, Over torque detection, torque limit, 17 Step Speed (max.), accel/decel, time switch, S-curve accel/decel, 3-wire sequence, Auto-Tuning (rotational, stationary), Online Tuning, Dwell control.																								
Protection Function	Motor Protection	Motor overheat protection based on output current																							
	Overvoltage Protection	200 V class: Stops when DC bus exceeds approx. 410 V, 400 V class: Stops when DC bus exceeds approx. 820 V																							
	Undervoltage Protection	200 V class: Stops when DC bus exceeds approx. 190 V, 400 V class: Stops when DC bus exceeds approx. 380 V																							
	Momentary Power Loss Ride-Thru	Stops immediately after 15 ms or longer power loss (default). Continuous operation during power up to 2 s (standard).																							
	Stall Prevention	Stall prevention during acceleration/deceleration and constant speed operation																							
Interface	Ground Fault Protection	Protection by electronic circuit																							
	Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50 V																							
	Digital Inputs	8 nos. programmable (24 VDC Sink/Source/External supply configurable)																							
	Digital Outputs	4 nos. (1 fixed / 3 programmable) 2 nos. open collector - 48 VDC & 2 nos. Relay - 230VAC / 30 VDC																							
	Analog Inputs	3 nos. Programmable - 2 nos. 0 to ±10 VDC & 1 no. 0/4 to 20mA																							
	Analog Outputs	2 nos. Programmable -10 to +10 VDC																							
	Pulse Train I/O	0 to 32 kHz max. - 1 no. input & 1 no. output																							
	Communication	Modbus RS422 / RS485 with speed upto 115.2 kbps																							
Option	Safety I/O	2 nos. hardware base block inputs & 1 no. Safety Electronic Device Monitor Output (Complying to UL508C, EN954-1 Cat.3, IEC/EN61508 SIL2)																							
	I/O	Analog Input (AI-A3) - 3 AI, Digital Input (DI-A3) - 16 DI, Analog Monitor (AO-A3) - 2 AO, Digital Output (DO-A3) - 8 DO																							
	Encoder Interface	PG-B3 for Complimentary Type PG upto 50KHz, PG-X3 for Line Driver Type PG upto 300KHz																							
	Communication	PROFIBUS-DP (SI-P3), DeviceNet(SI-N3), CANopen (SI-S3), MECHATROLINK-2 (SI-T3)																							
Environment	Others	LCD Operator, External 24V supply; Braking unit																							
	Area of Use	Indoors																							
	Ambient Temperature	-10 to +50°C																							
	Humidity	95% RH or less (no condensation)																							
	Storage Temperature	-20 to +60°C (short-term temperature during transportation)																							
	Altitude	Up to 1000 meters																							
Shock	10 Hz to 20 Hz, 9.8 m/s ² max. 20 Hz to 55 Hz, 5.9 m/s ² (400 V: 55 kW - HD or more) or 2.0 m/s ² max. (400 V: 75 kW- HD or less)																								
Standard Compliance			RoHS compliant										UL 508C, EN61800-3, EN61800-5-1, EN954-1 Cat.3, ISO 13849-1 (Cat.3, PLd), IEC/EN61508 SIL2												

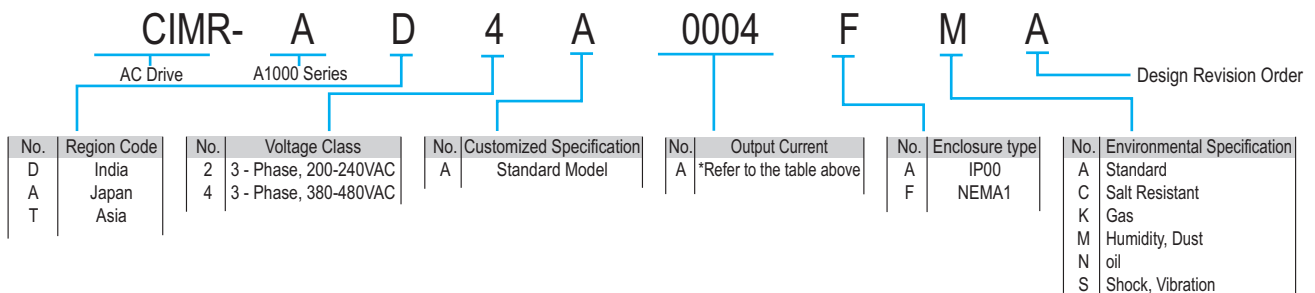
Overall Dimensions



400 V Class

Model CIMR-AD4A □□□□	Max. Application Motor Capacity (kw)		Dimensions (mm)			Weight (kg)	Cooling
	Normal Duty	Heavy Duty	W	H	D		
CIMR-AD4A0002FMA	0.75	0.4	140	260	147	3.2	Self cooling
CIMR-AD4A0004FMA	1.5	0.75					
CIMR-AD4A0005FMA	2.2	1.5					
CIMR-AD4A0007FMA	3.0	2.2	140	260	164	3.4	Fan cooling
CIMR-AD4A0011FMA	5.5	3.7			3.5		
CIMR-AD4A0018FMA	7.5	5.5			167	3.9	
CIMR-AD4A0023FMA	11	7.5			5.4		
CIMR-AD4A0031FMA	15	11	180	300	187	5.7	
CIMR-AD4A0038FMA	18.5	15			8.3		
CIMR-AD4A0044FMA	22	18.5	220	350	197	21	
CIMR-AD4A0058AMA	30	22	250	400	258	25	
CIMR-AD4A0072AMA	37	30	275	450		36	
CIMR-AD4A0088AMA	45	37	325	510	258	41	
CIMR-AD4A0103AMA	55	45					42
CIMR-AD4A0139AMA	75	55	325	550	283	79	
CIMR-AD4A0165AMA	90	75				96	
CIMR-AD4A0208AMA	110	90	450	705	330	102	
CIMR-AD4A0250AMA	132	110				107	
CIMR-AD4A0296AMA	160	132	500	800	350	125	
CIMR-AD4A0362AMA	185	160				221	
CIMR-AD4A0414AMA	220	185	500	950	370	221	
CIMR-AD4A0515AMA	250	220					
CIMR-AD4A0675AMA	355	315	670	1140	370	221	

Model Identification:



Electrical Standard Products (ESP) Branch Offices:

REGISTERED OFFICE AND HEAD OFFICE

L&T House, Ballard Estate
P. O. Box 278
Mumbai 400 001
Tel: 022-6752 5656
Fax: 022-6752 5858
Website: www.Larsentoubro.com

ELECTRICAL STANDARD PRODUCTS (ESP)

501, Sakar Complex I
Opp. Gandhigram Rly. Station
Ashram Road
Ahmedabad 380 009
Tel: 079-66304007-11
Fax: 079-26580491 / 66304025
e-mail: esp-ahm@LNTEBG.com

38, Cubbon Road, Post Box 5098
Bangalore 560 001
Tel: 080-25020100, 25593613
Fax: 080-25580525
e-mail: esp-blr@LNTEBG.com

131/1, Zone II
Maharana Pratap Nagar
Bhopal 462 011
Tel: 0755-4098706 / 7 / 8 / 9
Fax: 0755-2769264
e-mail: esp-bho@LNTEBG.com

Plot No. 559, Annapurna Complex
Lewis Road
Bhubaneswar 751 014
Tel: 0674-6451342, 2436696
Fax: 0674-2537309
e-mail: esp-bbi@LNTEBG.com

SCO 32, Sector 26-D
Madhya Marg, P. O. Box 14
Chandigarh 160 026
Tel: 0172-4646841 to 7
Fax: 0172-4646802
e-mail: esp-chd@LNTEBG.com

10, Club House Road
Chennai 600 002
Tel: 044-28462072 / 4 / 5 / 2109
Fax: 044-28462102 / 3
e-mail: esp-maa@LNTEBG.com

67, Appuswamy Road
Post Bag 7156
Opp. Nirmala College
Coimbatore 641 045
Tel: 0422-2588120 / 1 / 5
Fax: 0422-2588148
e-mail: esp-cbe@LNTEBG.com

L&T House, Group MIG - 5
Padmanabhpur
Durg 491 001
Tel: 0788-2213833 / 14 / 28 / 29
Fax: 0788-2213820

A1/11, Astronauts Avenue
Bidhan Nagar
Durgapur 713 212
Tel: 0343-2536891 / 8952 / 7844
Fax: 0343-2536493
e-mail: esp-dgp@LNTEBG.com

Milanpur Road, Bamuni Maidan
Guwahati 781 021
Tel: 0361-2651297
Fax: 0361-2551308
e-mail: esp-gau@LNTEBG.com

II Floor, Vasantha Chambers
5-10- 173, Fateh Maidan Road
Hyderabad 500004
Tel: 040-66720250
Fax: 040-23296468
e-mail: esp-hyd@LNTEBG.com

D-24, Prithvi Raj Road, C-Scheme
Jaipur 302 001
Tel: 0141-2385916 / 8
Fax: 0141-2373280
e-mail: esp-jai@LNTEBG.com

Akashdeep Plaza, 2nd Floor
P. O. Golmuri
Jamshedpur 831 003
Jharkhand
Tel: 0657-2340864 / 387
Fax: 0657-2341250
e-mail: esp-jam@LNTEBG.com

Skybright Bldg. M. G. Road
Ravipuram Junction, Ernakulam
Kochi 682 016
Tel: 0484-4409420 / 4 / 5 / 7
Fax: 0484-4409426
e-mail: esp-cok@LNTEBG.com

3-B, Shakespeare Sarani
Kolkata 700 071
Tel: 033-44002572 / 3 / 4
Fax: 033-22822589
e-mail: esp-ccu@LNTEBG.com

A28, Indira Nagar, Faizabad Road
Uttar Pradesh,
Lucknow 226 016
Tel: 0522-2312904 / 5 / 6
Fax: 0522-2311671
e-mail: esp-Lko@LNTEBG.com

Plot No. 518
4th Main Road
K. K. Nagar
Madurai 625 020
Tel: 0452-2537404, 2521068
Fax: 0452-2537552
e-mail: esp-mdu@LNTEBG.com

EBG North Wing Office - 2
Powai Campus
Mumbai 400 072
Tel: 022-67052874 / 2737 / 1156
Fax: 022-67051112
e-mail: esp-bom@LNTEBG.com

#12, Shivaji Nagar
North Ambazari Road
Nagpur 440 010
Tel: 0712- 2260012 / 3
Fax: 0712- 2260020 / 30
e-mail: esp-nag@LNTEBG.com

32, Shivaji Marg
P. O. Box 6223
New Delhi 110 015
Tel: 011-41419514 / 5 / 6
Fax: 011-41419600
e-mail: esp-del@LNTEBG.com

L&T House
P. O. Box 119
191/1, Dhole Patil Road
Pune 411 001
Tel: 020-26135048
Fax: 020-26124910, 26135048
e-mail: esp-pnq@LNTEBG.com

3rd Floor
Vishwakarma Chambers
Majura Gate, Ring Road
Surat 395 002
Tel: 0261-2473726
Fax: 0261-2477078
e-mail: esp-sur@LNTEBG.com

Radhadaya Complex
Old Padra Road
Near Charotar Society
Vadodara 390 015
Tel: 0265- 2311744 / 6613610 / 1 / 2
Fax: 0265-2336184
e-mail: esp-bar@LNTEBG.com

48-8-16, Dwarakanagar
Visakhapatnam 530 016
Tel: 0891-6620411-2 / 3
Fax: 0891-6620416
e-mail: esp-viz@LNTEBG.com

Product improvement is a continuous process. For the latest information and special applications, please contact any of our offices listed here.



Electrical Standard Products
Larsen & Toubro Limited
Powai Campus, Mumbai 400 072
Customer Interaction Center (CIC)
BSNL / MTNL (toll free) : 1800 233 5858
Reliance (toll free) : 1800 200 5858
Tel : 022 6774 5858
Fax : 022 6774 5859
E-mail : cic@LNTEBG.com
Website : www.LNTEBG.com

