

Mac E Series

Human Machine Interface

Installation Manual

E1100

Installation manual for the E1000 series operator terminals

Foreword

The E1000 operator terminal is developed to satisfy the demands of human-machine communication. Built-in functions such as displaying and controlling text, dynamic indication, time channels, alarm and recipe handling are included.

The operator terminal work, for the most part, is in an object-oriented way, making it easy to understand and use. The configuration operation of the terminal is made in a personal computer, using the configuration tool E-Designer. The project is then transferred and stored in the operator terminal.

The operator terminal can be connected to many types of automation equipment, such as PLCs, servos or drives. In this manual the expression “the controller” is used as a general term for the connected equipment.

This manual explains how to install the operator terminal. Please refer to the reference manual for further information.

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1 Safety Precautions

Both the installer and the owner and/or operator of the operator terminal must read and understand this installation manual.

1.1 UL Installation

Power, input and output (I/O) wiring must be in accordance with Class 1, Division 2 wiring methods (Article 501-4 (b) of the National Electric Code, NFPA 70) and in accordance with the authority having jurisdiction.

1.2 General

- Only qualified personnel may install or operate the operator terminal.
- The operator terminal must be installed according to the installation instructions.
- The operator terminal is designed for stationary installation on a plane surface, where the following conditions are fulfilled:
 - no high explosive risks
 - no strong magnetic fields
 - no direct sunlight
 - no large, sudden temperature changes
- Never allow fluids, metal filings or wiring debris to enter any openings in the operator terminal. This may cause fire or electrical shock.
- The operator terminal fulfills the requirements of article 4 of EMC directive 89/336/EEC.
- Storing the operator terminal where the temperature is lower/higher than recommended in this manual can cause the LCD display liquid to congeal/become isotopic.
- The LCD display liquid contains a powerful irritant. In case of skin contact, wash immediately with plenty of water. In case of eye contact, hold the eye open, flush with plenty of water and get medical attention.
- The supplier is not responsible for modified, altered or reconstructed equipment.
- Use only parts and accessories manufactured according to specifications of the supplier.
- Peripheral equipment must be appropriate for the application and location.
- The figures in this manual serves an illustrative purpose. Because of the many variables associated with any particular installation, the supplier cannot assume responsibility for actual use based on the figures.
- The supplier neither guarantees that the operator terminal is suitable for your particular application, nor assumes responsibility for your product design, installation or operation.

1.3 During Use

- Keep the operator terminal clean.
- Emergency stop and other safety functions may not be controlled from the operator terminal.
- Do not use too much force or sharp objects when touching the keys, display etc.

1.4 Service and Maintenance

- Only qualified personnel should carry out repairs.
- The agreed warranty applies.
- Before carrying out any cleaning or maintenance operations, disconnect the equipment from the electrical supply.
- Clean the display and surrounding front cover with a soft cloth and mild detergent.
- Replacing the battery incorrectly may result in explosion. Only use batteries recommended by the supplier.

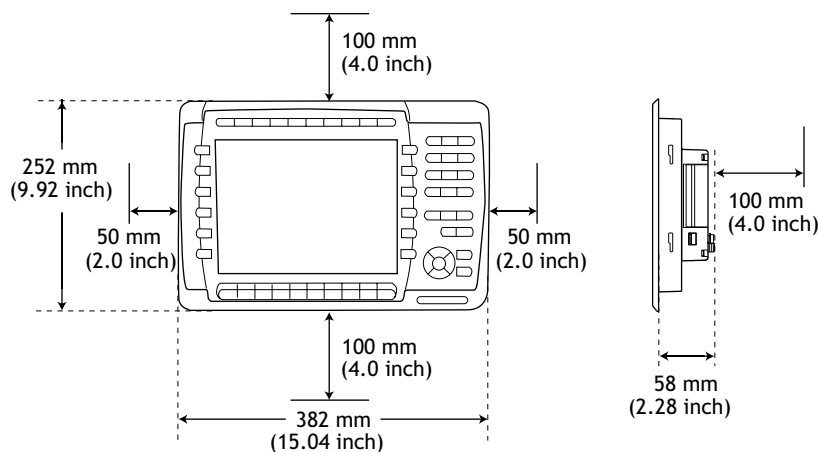
1.5 Dismantling and Scrapping

- The operator terminal or parts thereof shall be recycled according to local regulations.
- The following components contain substances that might be hazardous to health and the environment: lithium battery, electrolytic capacitor and display.

2 Installation

2.1 Space Requirements

- Installation plate thickness: 1.5 - 9.0 mm (0.06 - 0.35 inch)
- Space requirements when installing the operator terminal:

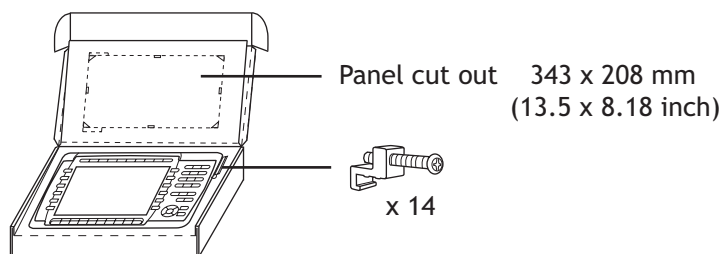


Caution

The openings on the enclosure are for air convection. Do not cover these openings.

2.2 Installation Process

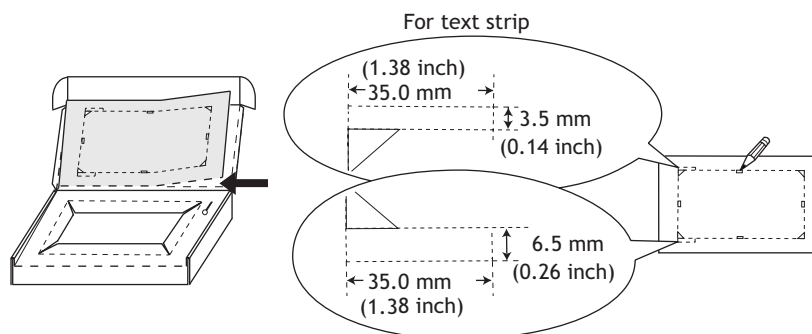
1. Unpack and check the delivery. If damage is found, notify the supplier.



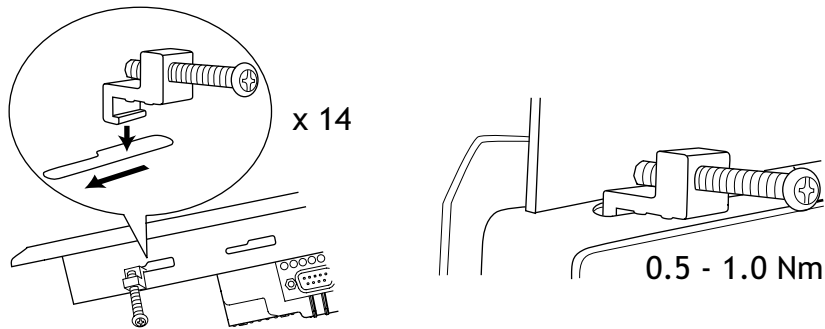
Note:

Place the operator terminal on a stable surface during installation. Dropping it or letting it fall may cause damage.

2. Place the panel cut out where the operator terminal is to be situated, draw along the outer sides of the holes and cut according to the markings. If access to the text strips is needed, add extra space in the left corners.



- Secure the operator terminal in position, using all the fastening holes and the provided brackets and screws:



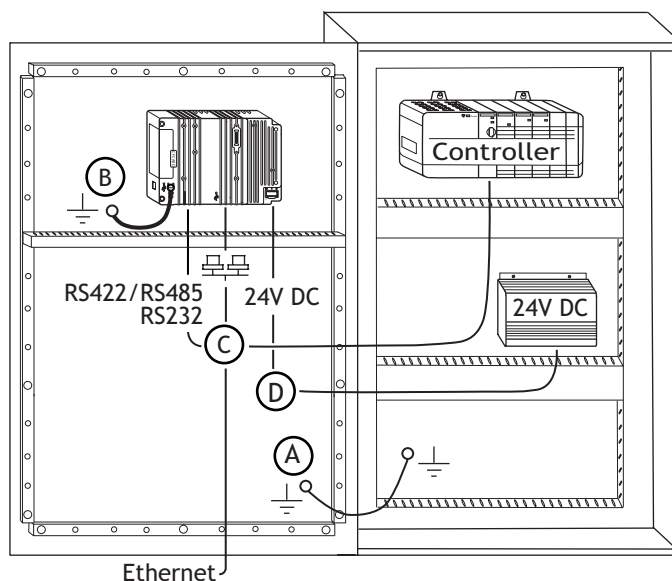
- Connect the cables in the specified order.

- Caution**

Ensure that the operator terminal and the controller system have the same electrical grounding (reference voltage level), otherwise errors in communication may occur.
- Use an M5 screw and a grounding conductor (as short as possible) with a cross-section of minimum 2.5 mm².
- Caution**

 - Use only shielded communication cables.
 - Separate high voltage cables from signal and supply cables.
- Caution**

 - The operator terminal must be brought to ambient temperature before it is started up. If condensation forms, ensure that the operator terminal is dry before connecting it to the power outlet.
 - Ensure that the voltage and polarity of the power source is correct.

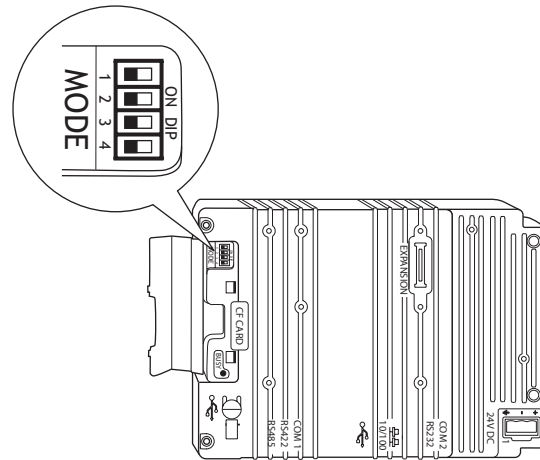


- Carefully remove the laminated film over the operator terminal display, to avoid static electricity that could damage the terminal.

2.2.1 Mode Switches

All mode switches must be in OFF position during operator terminal use.

The mode switches should not be touched unless by qualified personell.



2.2.2 Connections to the Controller

For information about the cables to be used when connecting the operator terminal to the controller, please refer to the help file for the driver in question.

2.2.3 Other Connections and Peripherals

Cables, peripheral equipment and accessories must be suitable for the application and its environment. For further details or recommendations, please refer to the supplier.



Caution

When using a compact flash card, do not remove the card when the busy indicator is illuminated.

3 Technical Data

Parameter	E1100
Front panel, W x H x D	382 x 252 x 6 mm
Mounting depth	58 mm (158 mm including clearance)
Front panel seal	IP 66
Rear panel seal	IP 20
Keyboard material	Membrane switch keyboard with metal domes. Overlay film of Autotex F157 * with print on reverse side. 1 million operations.
Reverse side material	Powder-coated aluminum
Weight	2.3 kg
Serial port RS422/ RS485	25-pin D-sub contact, chassis-mounted female with standard locking screws 4-40 UNC.
Serial port RS232C	9-pin D-sub contact, male with standard locking screws 4-40 UNC.
Ethernet	Shielded RJ 45
USB	Host type A, power consumption max. 500mA Device type B
CF-slot	Compact flash, type I and II
Flash memory for application	4 MB
Real time clock	±20 PPM + error because of ambient temperature and supply voltage. Total max error: 1 min/month at 25 °C Minimum life of the real time clock battery: 3 years Temperature coefficient: 0.004 ppm/°C ²
Power consumption at rated voltage	Normal: 0.5 A Maximum: 1.0 A
Display	TFT-LCD. 800 x 600 pixels, 64K color. CCFL backlight lifetime at the ambient temperature of +25 °C: 50,000 h.
Active area of display, W x H	211.2 x 158.4 mm
Fuse	Internal DC fuse, 3.15 AT, 5 x 20 mm
Power supply	+24V DC (20 - 30V DC). 3-pin jack connection block. CE: The power supply must conform with the requirements for SELV or PELV according to IEC 950 or IEC 742. UL: The power supply must conform with the requirements for class II power supplies.
Ambient temperature	Vertical installation: 0 ° to +50 °C Horizontal installation: 0 ° to +40 °C
Storage temperature	-20 ° to +70 °C
Relative humidity	5 - 85 % non-condensed
EMC tests on the operator terminal	The operator terminal conforms with the essential protection requirements in article 4 of the directive 89/336/EEC. Noise tested according to EN6100-6-4 emission and EN61000-6-2 immunity.
UL, cUL approvals	<i>Certification in progress</i>

* See section *Chemical Resistance for keyboard and display*

4 Chemical Resistance

4.1 Metal Casing

The frame and casing material is powder-coated aluminum. This powder paint withstands exposure of up to 24 hours duration to the following chemicals without visible change:

Ammonia 25%	Isopropyl alcohol	Nitric acid 3%
De-ionized water	Tap water	Chlorhydric acid 10%
Butanol	Cooling liquid 50%	Washer fluid 33%
Citric acid 10%	Ligroin	Sulphuric acid 20%
Diesel	Cooking oil	Turpentine
Ethanol 99.5% denaturated	Lactic acid 10%	Urea saturated
FAM-Normal petrol	Sodium di-chromate saturated	Hydroperoxide 3%
Alcohol 95%	Caustic soda 5%	Acetic acid 10%
Phosphoric acid 43%	Sodium hypochlorite solution	Alu-cleaner
Glycol	Sodium carbonate 10%	-
Industrial petrol	Sodium chloride 20%	-

4.2 Keyboard and Display

4.2.1 Autotex F157

Autotex F157 covers the membrane keyboard.

Solvent Resistance

Autotex F157 withstands exposure of more than 24 hours duration under DIN 42 115 Part 2 to the following chemicals without visible change:

Potassium ferrocyanide/ ferricyanide	Sodium hypchlorite <20% (bleach)	1.1.1. Trichloroethane (Genklene)
Cyclohexanol	Acetaldehyde	Ethylacetate
Diacetone alcohol	Aliphatic hydrocarbons	Diethyl ether
Glycol	Toluene	N-Butyl acetate
Isopropanol	Xylene	Amylacetate
Glycerine	White spirit	Butyccellosolve
Methanol	Formic acid <50%	Ether
Triacetin	Acetic acid <50%	MIBK
Dowanol DRM/PM	Phosphoric acid <30%	Cutting oil
Acetone	Hydrochloric acid <36%	Potassium carbonate
Metyl ethyl ketone	Nitric acid <10%	Washing powders
Dioxan	Trichloroacetic acid <50%	Fabric conditioner
Cyclohexanone	Sulphuric acid <10%	Ferric chloride
Ethanol	Formaldehyde 37% - 42%	Ferrous chlorid
Isophorone	Potassium hydroxide <30%	Dibutyl Phthalate

Ammonia <40%	Linseed oil	Dioctyl Phthalate
Caustic soda <40%	Paraffin oil	Sodium carbonate
Hydrogen peroxide <25%	Blown castor oil	Petrol
Alkalicarbonate	Silicone oil	Teepol
Bichromate	Turpentine substitute	Water
Diesel oil	Univeral brake fluid	Sea water
Acetonitrile	Decon	-
Sodium bisulphate	Aviation fuel	-

Autotex withstands DIN 42 115 Part 2 exposure of up to 1 hour duration to glacial acetic acid without visible change.

Autotex is not resistant to high pressure steam at over 100 °C or the following chemicals:

Concentrated mineral acids	Benzyl alcohol
Concentrated caustic solution	Mehylene chloride

Autotex withstands 24 hours exposure to the following reagents at 50 °C without visible staining:

Top Job	Grape Juice	Ariel	Ajax
Jet Dry	Milk	Persil	Vim
Gumption	Coffee	Wisk	Domestos
Fantastic	-	Lenor	Vortex
Formula 409	-	Downey	Windex

Very slight discoloration was noted under critical viewing conditions with the following materials:

Tomato juice	Tomato ketchup	Lemon juice	Mustard
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Outdoor Use

In common with all polyester based films Autotex F157 is not suitable for use in conditoins of long term exposure to direct sunlight.

4.2.2 Display Surface

The display surface on the operator terminal withstands exposure of more than 24 hours duration to the following chemicals without visible change:

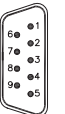
Acetic acid <5%	Dichloromethane	Nitric acid (specific gravity 1.42)
Glacial acetic acid (specific gravity 1.05)	Di-ethylether	Nitric acid <40%
Ethyl acetate	Di-isobutylene	Oleic acid
Acetone	Di-methyl hormamide	Olive oil
Aqueous ammonia (specific gravity 0.9)	Ethyl alcohol <95%	Pure water
Aqueous ammonia <10%	2-ethyl hexoic acid	Seawater
Benzene	Hydrochloric acid <35%	Sodium carbonate <20%

Carbon tetrachloride	Hydrogen peroxide <28%	Sodium hypochlorite <10%
Caustic soda <48%	Isopropyl alcohol	Sulfuric acid (specific gravity 1.84)
Citric acid	Kerosene	Sulfuric acid <30%
Cotton seed oil	Methy alcohol	Toluene

5 Operator Terminal Drawings

5.1 Communication Ports

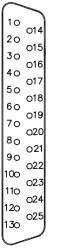
RS-232



Pin no	Signal	Signal Name	Signal direction
1	DCD	Data Carrier Detect	Input
2	RD	Receive Data	Input
3	TD	Transmit Data	Output
4	DTR	Data Terminal Ready	Output
5	SG	Signal Ground	-
6	DSR	Data Set Ready	Input
7	RTS	Request To Send	Output
8	CTS	Clear To Send	Input
9	RI	Ring Indicator	Input

D-sub
9-pin Male

RS-422/485

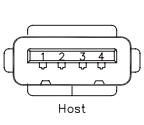


Pin no	RS-422		RS-485	
	Signal	Signal direction	Signal	Signal direction
2	TxD+	Output	Tx/Rx+	In/Output
15	TxD-	Output	Tx/Rx-	In/Output
3	RxD+	Input		
16	RxD-	Input		
4	RTS+	Output		
17	RTS-	Output		
5	CTS+	Input		
18	CTS-	Input		
20	1)			
21	1)			
6	Do not use		2) Bus termination	4) Connect to pin no.19 for bus-termination.
19	Do not use		3) Bus termination	See above
7,8	0V		0V	
14	+5V <100mA	Output	+5V <100mA	Output

D-sub
25-pin Female

- 1) Pin no 20 connected to pin no 21 internal in the terminal
- 2) Directly connected internally to pin no. 2 (Tx/Rx+).
- 3) Connected to pin no. 15 (Tx/Rx-) internally via a 120ohm 1/4W resistor.
- 4) NOTE! Only the first and the last unit on the bus should be terminated.

USB

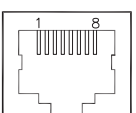


Pin no	Signal	Signal direction
1	VBUS	-
2	D-	In/Output
3	D+	In/Output
4	GND	-

Host Device

Frame connected to chassis.

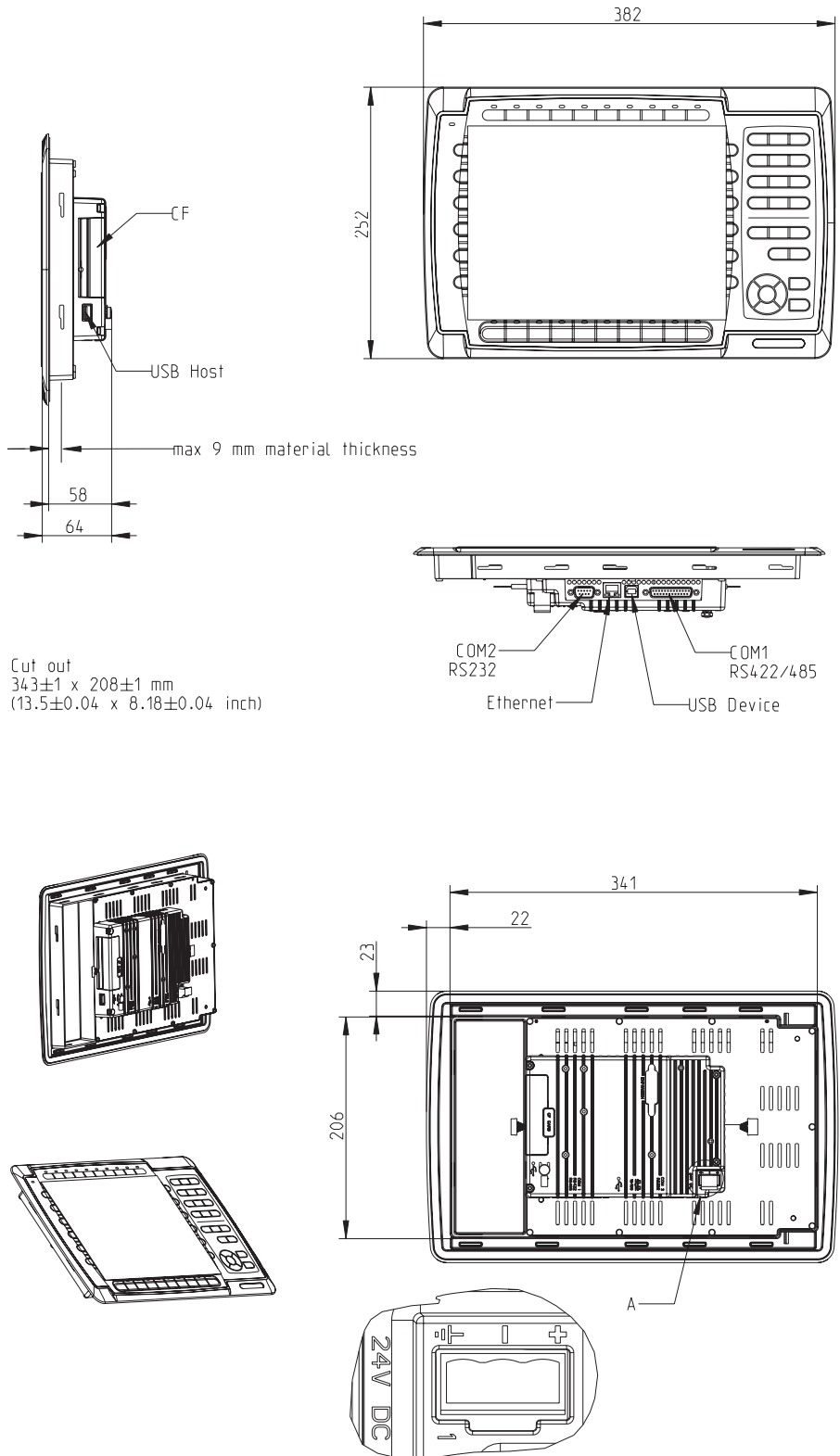
Ethernet



Pin no	Signal	Signal direction
1	Tx+	Output
2	Tx-	Output
3	Rx+	Input
6	Rx-	Input
4,5,7,8	GND	

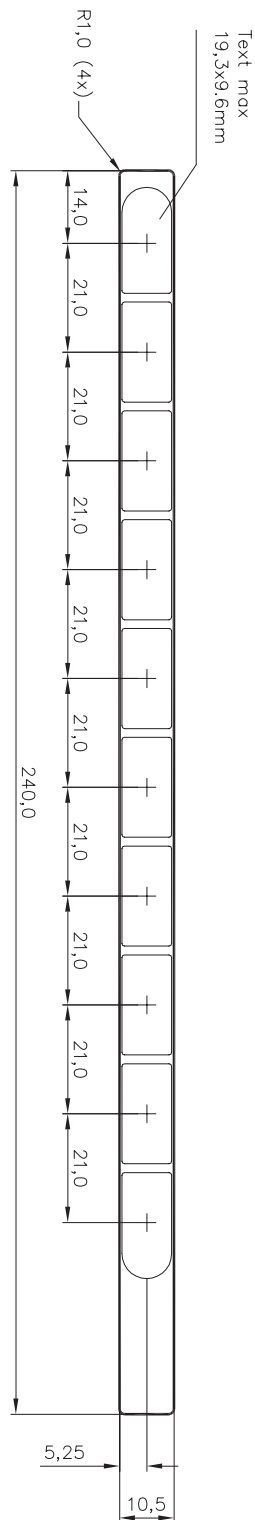
Drawing No. 5005S, Date 2004-10-27

5.2 E1100 Outline



Drawing No. 5083S, Date 2004-10-14 (Revision date 2005-02-03)

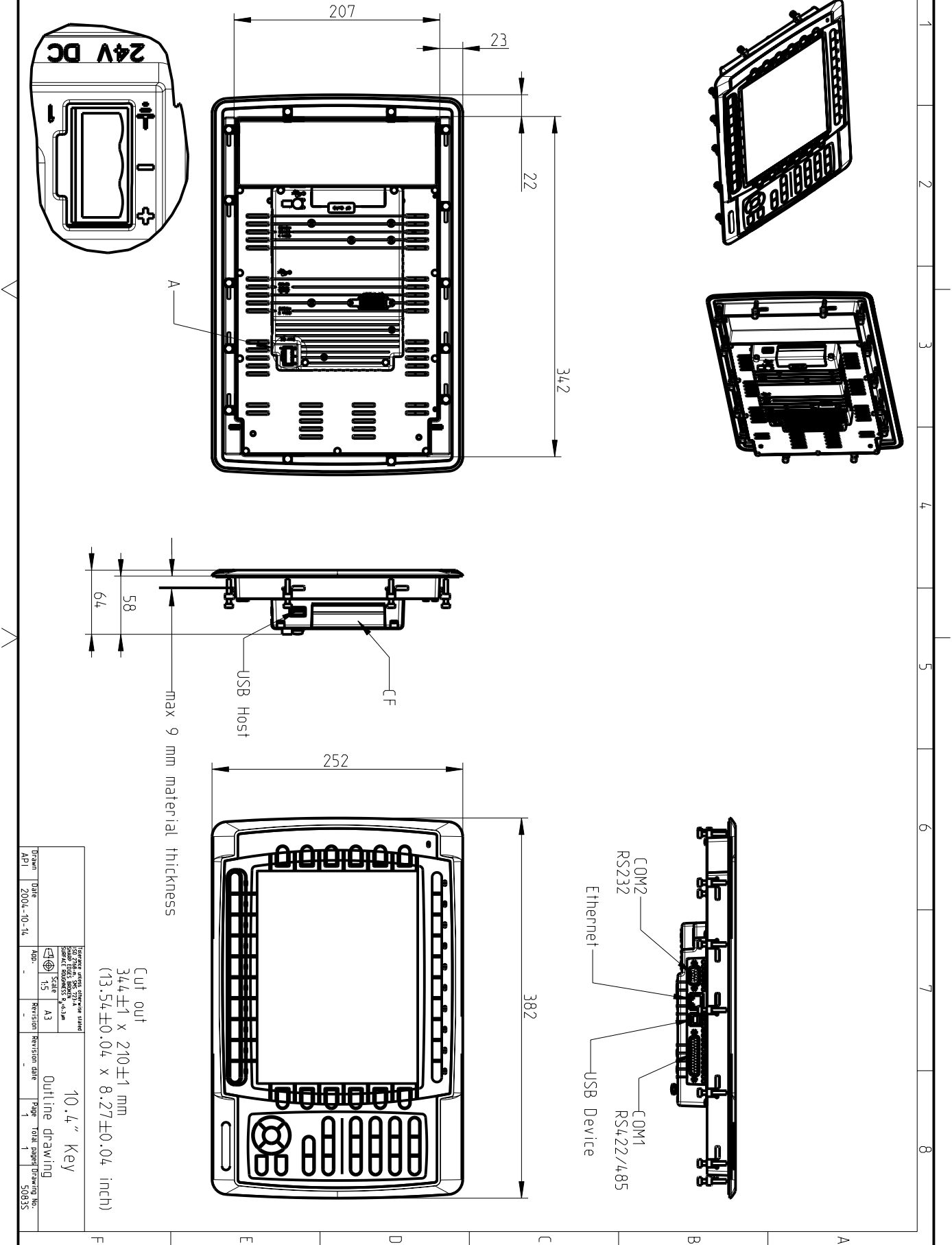
5.3 E1100 Text Strip

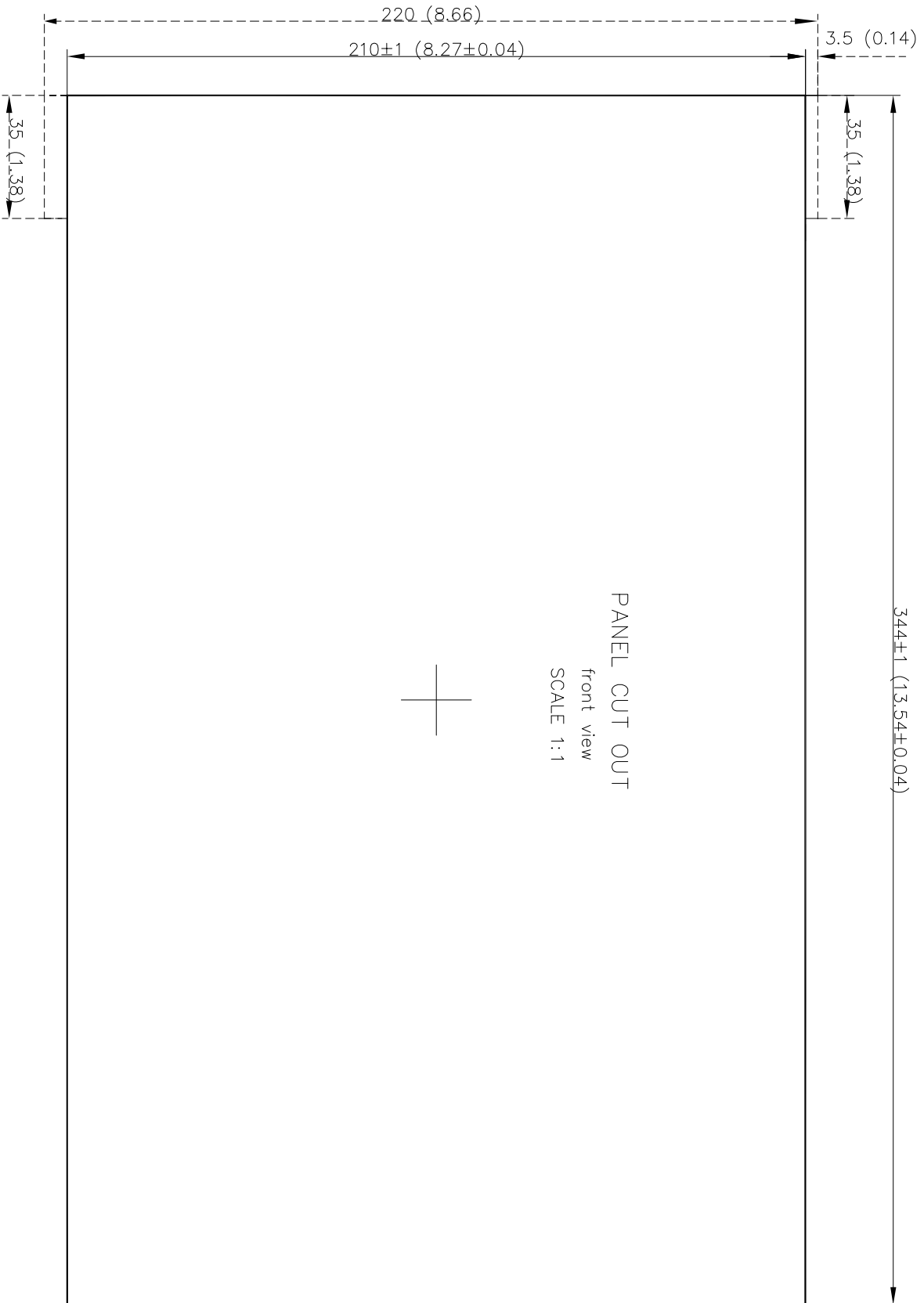


Drawing No. 5077S, Date 2004-09-24

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PANEL CUT OUT
 front view
 SCALE 1:1

HEADQUARTERS

MITSUBISHI ELECTRIC EUROPE B.V. EUROPE
 German Branch
 Gothaer Straße 8
D-40880 Ratingen
 Phone: +49 (0) 2102 / 486-0
 Fax: +49 (0) 2102 / 486-1120
 e mail: megfamail@meg.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. FRANCE
 French Branch
 25, Boulevard des Bouvets
F-92741 Nanterre Cedex
 Phone: +33 1 55 68 55 68
 Fax: +33 1 55 68 56 85
 e mail: factory.automation@framee.com

MITSUBISHI ELECTRIC EUROPE B.V. IRELAND
 Irish Branch
 Westgate Business Park, Ballymount
IRL-Dublin 24
 Phone: +353 (0) 1 / 419 88 00
 Fax: +353 (0) 1 / 419 88 90
 e mail: sales.info@meir.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. ITALY
 Italian Branch
 Via Paracelso 12
I-20041 Agrate Brianza (MI)
 Phone: +39 039 6053 1
 Fax: +39 039 6053 312
 e mail: factory.automation@it.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. SPAIN
 Spanish Branch
 Carretera de Rubí 76-80
E-08190 Sant Cugat del Vallés
 Phone: +34 9 3 / 565 3160
 Fax: +34 9 3 / 589 1579
 e mail: industrial@sp.mee.com

MITSUBISHI ELECTRIC EUROPE B.V. UK
 UK Branch
 Travellers Lane
GB-Hatfield Herts. AL10 8 XB
 Phone: +44 (0) 1707 / 27 61 00
 Fax: +44 (0) 1707 / 27 86 95
 e mail: automation@meuk.mee.com

MITSUBISHI ELECTRIC CORPORATION JAPAN
 Office Tower "Z" 14 F
 8-12,1 chome, Harumi Chuo-Ku
Tokyo 104-6212
 Phone: +81 3 6221 6060
 Fax: +81 3 6221 6075

MITSUBISHI ELECTRIC AUTOMATION USA
 500 Corporate Woods Parkway
Vernon Hills, IL 60061
 Phone: +1 847 / 478 21 00
 Fax: +1 847 / 478 22 83

MIDDLE EAST REPRESENTATIVES

TEXEL Electronics Ltd. ISRAEL
 Box 6272
IL-42160 Netanya
 Phone: +972 (0) 9 / 863 08 91
 Fax: +972 (0) 9 / 885 24 30
 e mail: texel_me@netvision.net.il

EUROPEAN REPRESENTATIVES

GEVA AUSTRIA
 Wiener Straße 89
AT-2500 Baden
 Phone: +43 (0) 2252 / 85 55 20
 Fax: +43 (0) 2252 / 488 60
 e mail: office@geva.at

TEHNIKON BELARUS
 Oktjabrskaya 16/5, Ap 704
BY-220030 Minsk
 Phone: +375 (0)17 / 210 4626
 Fax: +375 (0)17 / 210 4626
 e mail: tehnikon@belsonet.net

Koning & Hartman B.V. BELGIUM
 Researchpark Zellik, Pontbeeklaan 43
BE-1731 Brussels
 Phone: +32 (0)2 / 467 17 44
 Fax: +32 (0)2 / 467 17 48
 e mail: info@koningenhartman.com

TELECON CO. BULGARIA
 Andrej Ljapchev Lbv. P. 21 4
BG-1756 Sofia
 Phone: +359 (0) 2 / 97 44 05 8
 Fax: +359 (0) 2 / 97 44 06 1
 e mail: —

AutoCont CZECH REPUBLIC
 Control Systems s.r.o.
 Nemocnici 12
CZ-702 00 Ostrava 2
 Phone: +420 59 / 6152 111
 Fax: +420 59 / 6152 562
 e mail: consys@autocont.cz

louis poulsen DENMARK
 industri & automation
 Geminivej 32
DK-2670 Greve
 Phone: +45 (0) 70 / 10 15 35
 Fax: +45 (0) 43 / 95 95 91
 e mail: lpia@lpmail.com

UTU Elektrotehnika AS ESTONIA
 Pärnu mnt.160i
EE-11317 Tallinn
 Phone: +372 (0) 6 / 51 72 80
 Fax: +372 (0) 6 / 51 72 88
 e mail: utu@utu.ee

Beijer Electronics OY FINLAND
 Ansatie 6a
FIN-01740 Vantaa
 Phone: +358 (0) 9 / 886 77 500
 Fax: +358 (0) 9 / 886 77 555
 e mail: info@beijer.fi

UTECO A.B.E.E. GREECE
 5, Mavrogenous Str.
GR-18542 Piraeus
 Phone: +302 (0) 10 / 42 10 050
 Fax: +302 (0) 10 / 42 12 033
 e mail: sales@uteco.gr

Meltrade Ltd. HUNGARY
 Fertő Utca 14.
HU-1107 Budapest
 Phone: +36 (0)1 / 431-9726
 Fax: +36 (0)1 / 431-9727
 e mail: office@meltrade.hu

SIA POWEL LATVIA
 Lienes iela 28
LV-1009 Riga
 Phone: +371 784 / 22 80
 Fax: +371 784 / 22 81
 e mail: utu@utu.lv

UAB UTU POWEL LITHUANIA
 Savanoriu pr. 187
LT-2053 Vilnius
 Phone: +370 (0) 52323-101
 Fax: +370 (0) 52322-980
 e mail: powel@utu.lt

EUROPEAN REPRESENTATIVES

INTEHSIS SRL MOLDOVA
 Cuza-Voda 36/1-81
MD-2061 Chisinau
 Phone: +373 (0)2 / 562 263
 Fax: +373 (0)2 / 562 263
 e mail: intehsis@mdl.net

Koning & Hartman B.V. NETHERLANDS
 Donauweg 2 B
NL-1000 AK Amsterdam
 Phone: +31 (0)20 / 587 76 00
 Fax: +31 (0)20 / 587 76 05
 e mail: info@koningenhartman.com

Beijer Electronics A/S NORWAY
 Teglverksveien 1
N-3002 Drammen
 Phone: +47 (0) 32 / 24 30 00
 Fax: +47 (0) 32 / 84 85 77
 e mail: info@beijer.no

MPL Technology Sp. z o.o. POLAND
 ul. Sliczna 36
PL-31-444 Kraków
 Phone: +48 (0) 12 / 632 28 85
 Fax: +48 (0) 12 / 632 47 82
 e mail: krakow@mpl.pl

Sirius Trading & Services srl ROMANIA
 Str. Biharia No. 67-77
RO-013981 Bucuresti 1
 Phone: +40 (0) 21 / 201 1146
 Fax: +40 (0) 21 / 201 1148
 e mail: sirius@siriustrading.ro

INEA SR d.o.o. SERBIA AND MONTENEGRO
 Karadjordjeva 12/260
SCG-113000 Smederevo
 Phone: +381 (0)26 / 617 - 163
 Fax: +381 (0)26 / 617 - 163
 e mail: inea_sr@verat.net

AutoCont Control s.r.o. SLOVAKIA
 Radlinského 47
SK-02601 Dolný Kubín
 Phone: +421 435868 210
 Fax: +421 435868 210
 e mail: info@autocontcontrol.sk

INEA d.o.o. SLOVENIA
 Stegne 11
SI-1000 Ljubljana
 Phone: +386 (0) 1-513 8100
 Fax: +386 (0) 1-513 8170
 e mail: inea@inea.si

Beijer Electronics AB SWEDEN
 Box 424
S-20126 Malmö
 Phone: +46 (0) 40 / 35 86 00
 Fax: +46 (0) 40 / 35 86 02
 e mail: info@beijer.se

ECONOTEC AG SWITZERLAND
 Postfach 282
CH-8309 Nürensdorf
 Phone: +41 (0) 44 / 838 48 11
 Fax: +41 (0) 44 / 838 48 12
 e mail: info@econotec.ch

GTS TURKEY
 Darülaceze Cad. No. 43 Kat. 2
TR-80270 Okmeydani-Istanbul
 Phone: +90 (0) 212 / 320 1640
 Fax: +90 (0) 212 / 320 1649
 e mail: gts@turk.net

CSC Automation Ltd. UKRAINE
 15, M. Raskova St., Fl. 10, Office 1010
UA-02002 Kiev
 Phone: +380 (0) 44 / 494 3355
 Fax: +380 (0) 44 / 494 3366
 e mail: csc-a@csc-a.kiev.ua

EURASIAN REPRESENTATIVES

Kazpromautomatics Ltd. KAZAKHSTAN
 2, Scladskaya Str.
KAZ-470046 Karaganda
 Phone: +7 3212 50 11 50
 Fax: +7 3212 50 11 50
 e mail: info@kpakz.com

Avtomatika Sever Ltd. RUSSIA
 Lva Tolstogo Str. 7, Off. 311
RU-197376 St Petersburg
 Phone: +7 812 1183 238
 Fax: +7 812 1183 239
 e mail: as@avtsev.spb.ru

Consys RUSSIA
 Promyshlennaya St. 42
RU-198099 St Petersburg
 Phone: +7 812 325 3653
 Fax: +7 812 147 2055
 e mail: consys@consys.spb.ru

Electrotechnical Systems Siberia RUSSIA
 Shtetinkina St. 33, Office 116
RU-630088 Novosibirsk
 Phone: +7 3832 / 119598
 Fax: +7 3832 / 119598
 e mail: info@eltechsystems.ru

Elektrostyle RUSSIA
 Poslannikov Per., 9, Str.1
RU-107005 Moscow
 Phone: +7 095 542 4323
 Fax: +7 095 956 7526
 e mail: info@estl.ru

Elektrostyle RUSSIA
 Krasnij Prospekt 220-1, Office No. 312
RU-630049 Novosibirsk
 Phone: +7 3832 / 106618
 Fax: +7 3832 / 106626
 e mail: info@estl.ru

ICOS RUSSIA
 Industrial Computer Systems Zao
 Ryazanskij Prospekt, 8A, Off. 100
RU-109428 Moscow
 Phone: +7 095 232 0207
 Fax: +7 095 232 0327
 e mail: mail@icos.ru

NPP Uralelektra RUSSIA
 Sverdlova 11A
RU-620027 Ekaterinburg
 Phone: +7 34 32 / 532745
 Fax: +7 34 32 / 532745
 e mail: elektra@etel.ru

STC Drive Technique RUSSIA
 Poslannikov Per., 9, Str.1
RU-107005 Moscow
 Phone: +7 095 790 7210
 Fax: +7 095 790 7212
 e mail: info@privod.ru

AFRICAN REPRESENTATIVE

CBI Ltd. SOUTH AFRICA
 Private Bag 2016
ZA-1600 Isando
 Phone: +27 (0) 11 / 928 2000
 Fax: +27 (0) 11 / 392 2354
 e mail: cbi@cbi.co.za