

ERITECH®

ERITECH® SYSTEM 1000

ESE Lightning Protection Products



ERICO®

Active Protection

ERICO® is a world leader in the provision of grounding solutions and lightning and surge protection technologies.

ERICO recognizes the importance of an integrated strategy in providing lightning protection and has incorporated several major concepts into a Six Point Plan of Protection:

1. Capture the lightning strike
2. Convey this energy to ground
3. Dissipate energy into the grounding system
4. Bond all ground points together
5. Protect incoming AC power feeders
6. Protect low voltage data/ telecommunications circuits

An unparalleled level of progressive engineering support and experience is built into each lightning and surge protection product and grounding solution. ERICO has developed specialized design software to enable the integration of all aspects affecting system performance, including local conditions, to help ensure that requirements of relevant standards are met or exceeded.

ERICO products are manufactured to ISO 9001:2000 and are subjected to rigorous field and laboratory testing and computer modeling during product development. They are backed by extensive literature, test reports and technical papers, data sheets, installation instructions and risk-analysis software.

ERICO operates in every region of the world and supports the global market with an extensive distribution network to help ensure that our products and expertise are available for any project, regardless of size or location. Dedicated consulting teams assess the requirements of any project and provide expertise for optimal lightning protection solutions.



Active Protection

ERICO offers three ERITECH® INTERCEPTOR SI air terminals.

- SI25 with a triggering advance of 25 μ s
- SI40 with a triggering advance of 40 μ s
- SI60 with a triggering advance of 60 μ s

The ERITECH INTERCEPTOR SI is an Early Streamer Emission (ESE) air terminal in accordance to the NFC 17-102 standard. The design requirements, protection level calculations and protection radius are obtained from this standard.



Due to the internal control circuit, the ERITECH INTERCEPTOR SI enables the early launching of an upward leader compared to other passive components.

1. Strike tip
2. Stainless steel, corrosion resistant body
3. High voltage control section
4. Locking screw
5. Threaded mast coupling
6. Support mast



Testing and Working Principles

Testing

The ERITECH® INTERCEPTOR SI ESE has been extensively tested at an independent high voltage laboratory* in accordance with the requirements of French NFC 17-102 and Spanish norm UNE-21186. The testing, as defined in the above two standards, was designed to simulate naturally occurring conditions and allow comparison of the performance between differing types of lightning protection systems.

The test simulates natural field conditions where a field impulse (the one due to the downward leader approaching ground, simulated by a Marx Generator with a long front time) is superimposed onto a permanent field (the one due to the charge between cloud and ground, simulated in the laboratory by a DC generator).

The corona at the tip of the rod is measured by a photo-multiplier that enables the determination of the triggering time of both the simple passive rod (SR) and the ERITECH INTERCEPTOR SI ESE.

The average value is then determined for both a simple passive rod and the ERITECH INTERCEPTOR SI ESE. The time difference is then $T(SR)$ minus $T(SI)$ to achieve the ΔT advantage for the ERITECH INTERCEPTOR SI ESE.

Working Principles

During thunderstorm conditions when the lightning down-leader is approaching ground level, an upward leader may be created by any conductive surface. In the case of a passive lightning rod, the upward leader propagates only after a long period of charge reorganization. In the case of the ERITECH INTERCEPTOR SI ESE, the initiation time of an upward leader is greatly reduced.

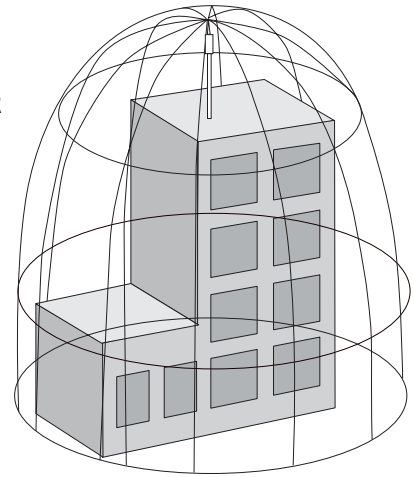
The ERITECH INTERCEPTOR SI ESE generates controlled magnitude and frequency pulses at the tip of the terminal during high static fields characteristic prior to a lightning discharge. This enables the creation of an upward leader from the terminal that propagates towards the downward leader coming from the thundercloud.

* Test report available upon request.

ERITECH® INTERCEPTOR SI ESE

Early Streamer Emission
Lightning Terminal

According to
the NFC 17-102
and UNE-21186
Standard



ERICO® is dedicated to providing the best lightning protection solution for any given application, whether this involves the use of the standards-compliant ERITECH® SYSTEM 1000, ERITECH® SYSTEM 2000, ERITECH® SYSTEM 3000 or a hybrid design utilizing a combination of multiple system types. ERICO® manufactures lightning protection systems in full accordance with more than twelve national and international standards, as well as non-conventional systems based on enhanced air terminals and insulated conductors for applications where these provide an advantageous solution for the customer.

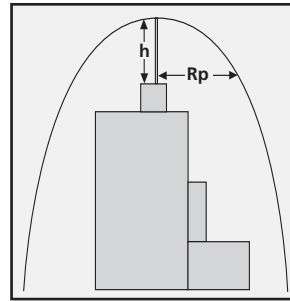
ERICO's approach is solutions driven. Some applications are more suited to the traditional conventional lightning protection – designs that require protection via complete building structure bonding. Other applications are more suited to a method that utilizes protection via isolation or applications that require area protection or the decision may be purely based on a risk – assessment evaluation.

Features

- Designed and tested to NFC 17-102, UNE-21186 and NP4426
- Stainless steel design suitable for most environments
- Available in three models to suit specific site requirements
- Suitable for connection to a variety of downconductor systems including tape, cable, smooth-weave and ERITECH® ERICORE conductor
- Fully compatible with the ERITECH SYSTEM 3000 mast, ERITECH ERICORE cable and accessories

Protecting Areas

According to NFC 17-102 1995, the standard protection radius (R_p) of the ERITECH® INTERCEPTOR SI ESE is linked to ΔT (below), the protection levels I, II or III (as calculated in Annex B of NFC 17-102) and the height of the ERITECH INTERCEPTOR SI ESE above the structure to be protected (H , defined by NFC 17-102 as a minimum 2 m).



Protection Level	Protection Level 1 (98%, D = 20 m)			Protection Level 2 (95%, D = 45 m)			Protection Level 3 (80%, D = 60 m)		
	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60
Model	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60
ΔT (μs)	25	40	60	25	40	60	25	40	60
Rp (m) Protection Radius									
h (m)									
2	17	23	32	23	30	40	26	34	44
3	25	35	48	34	45	59	39	50	65
4	34	46	64	46	60	78	52	67	87
5	42	58	79	57	75	97	65	83	107
6	43	59	79	58	76	97	66	84	107
7	44	59	79	59	76	98	67	85	108
8	44	59	79	60	77	99	68	86	108

Where $h > 5$ m, then R_p can be calculated from

$$R_p = \sqrt{h(2D-h) + \Delta L(2D+\Delta L)}$$

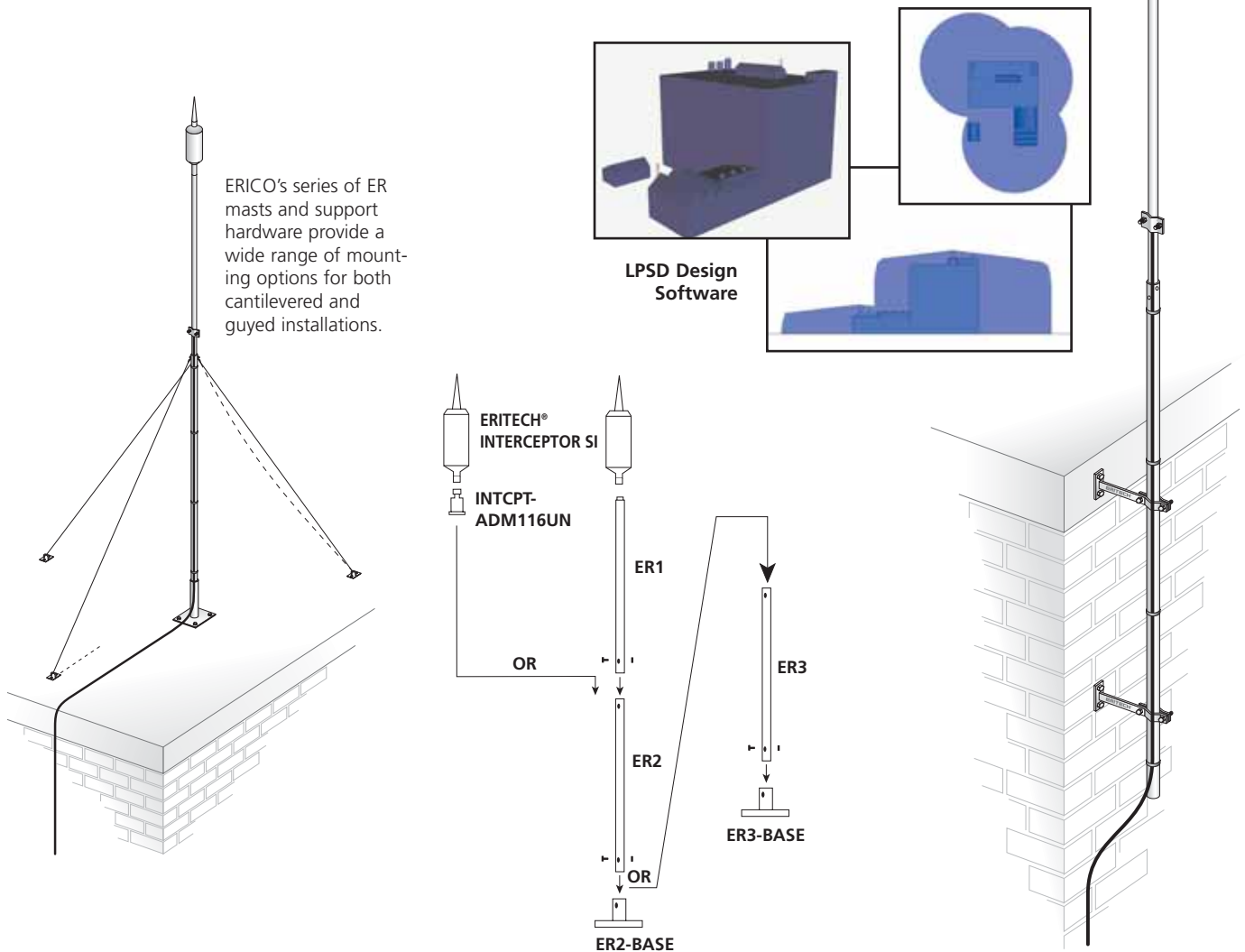
$\Delta L = v(m/\mu s) \times \Delta T(\mu s)$, where v is assumed to be $1m/\mu s$
 D = Protection Level, where $D = 20, 45$ or 60 m



Design

The aim of lightning protection design is to mitigate all the factors that can impact the lightning risk. The requirements of NFC 17-102 Annex B provide guidance on calculation and selection of protection level for each specific application.

ERICO's unique computer-aided program provides design support for a variety of design techniques and standards including both NFC 17-102 and UNE-21186. Based on individual site parameters such as structure dimensions, terminal type and protection requirements, each LPSD (Lightning Protection System Design) design is customized for the project. It provides elevation, 3D and plan views enabling terminal location, downconductor routing and grounding system requirements to be optimized for your facility.



System Requirements:

The design and installation of the terminals should be completed in compliance with the requirements of the French Standard NFC 17-102. In summary, this standard limits the terminal's application to structures less than 60 m high. In addition to providing the protection level calculation and terminal placement requirements, the standard requires one or two downconductors depending upon building profile. A downconductor cross-sectional area of $\geq 50 \text{ mm}^2$ with minimum dimensions is specified. For copper, the dimensions are 30 x 2 mm or 8 mm diameter. The downconductor(s) are to be secured at three points per meter with equipotential bonding made to nearby metallic items.

Each downconductor requires a test clamp and dedicated earth system of 10 ohms or less. Should 10 ohms not be achievable, then 100 m of conductor with no single vertical or horizontal element exceeding 20 m is acceptable. The lightning protection ground should be connected to the main building ground and any nearby buried metallic items.

The NFC 17-102 requirement for inspection and testing ranges from each year to every three years dependant upon location and protection level selected.

Ordering Information

Air Terminals



ERITECH® INTERCEPTOR SI

SI 25	(701535)	25 µs	5 kg
SI 40	(701536)	40 µs	5 kg
SI 60	(701537)	60 µs	5 kg



Mast Bracket

ACF-2-GS (103100) 2.1 kg

Parallel pipe clamp for masts 30 to 50 mm diameter. Supplied as set of two brackets.

Masts and Bases



Masts and Bases

ER1-1000-SS	(702255)	Upper section, 1 m	3.5 kg
ER1-2000-SS	(702260)	Upper section, 2 m	6.2 kg
ER2-2000-SS	(702265)	Mid section, 2 m	4.9 kg
ER2-3000-SS	(702270)	Mid section, 3 m	7.3 kg
ER3-2000-SS	(702275)	Lower section, 2 m	5.3 kg
ER3-3000-SS	(702280)	Lower section, 3 m	7.9 kg
ER2-BASE-SS	(702290)	Base for ER2 mast	5.2 kg
ER3-BASE-SS	(702295)	Base for ER3 mast	5.6 kg
ER1-xxxx-SS		mast diameter 25 mm	
ER2-xxxx-SS		mast diameter 32 mm	
ER3-xxxx-SS		mast diameter 38 mm	

Adapters



ER2-xxxx-SS Adapter

INTCPT-ADM116UN (702301) 0.1 kg

Adapter to allow ERITECH INTERCEPTOR SI terminal to connect direct to ER2-xxxx-SS masts.



Water Pipe Adapter

INTCPT-AD2BSPF* (702297) 0.1 kg
INTCPT-ADF2NSP** (702298) 0.1 kg

For mounting Air Terminals to non-insulated water pipe masts
* 2" British thread
** 2" USA thread

Masts Accessories



Guy Kit

GUYKIT4MGRIP	(701305)	4 m	0.4 kg
GUYKIT7MGRIP	(701315)	7 m	0.7 kg

Guy kits for 4 m and 7 m vertical guy heights



Adapter to 3/4" thread

INTCPT-ADM3/4UNC (702299) 0.1 kg

Adapter to mount Air Terminal to conventional 3/4" lightning protection hardware.



Mast Butt Adapter

INTCPT-ADBUTT (702296) 0.05 kg

Required to mount the ERITECH INTERCEPTOR Air Terminal into the System 3000 FRP mast.



Mast Clamp

TMC-SS (702165) 0.2 kg

Clamp for connecting 25x3, 30x2 or 8 mm diameter conductor to ER1 or ER2 masts.



Cable Tie

CABTIE-SS (701420) 0.05 kg

520 mm stainless steel cable tie for strapping down conductor to lower mast sections

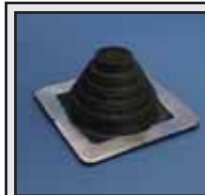
Accessories



Lightning Event Counter

LEC-IV (702050) 2.0 kg

Installed on downconductor to record number of lightning strikes.



Waterproof Cone

WPC (702230) 0.07 kg



Mast Bracket

ALOF-1-GS (702175) 1.5 kg

280 mm galvanized steel bracket for masts 28 to 55 mm diameter.



Mast Bracket

LSEB 4554 (702180) 10.5 kg

550 mm galvanized steel bracket for masts 38 to 76 mm diameter. Supplied as set of two brackets.



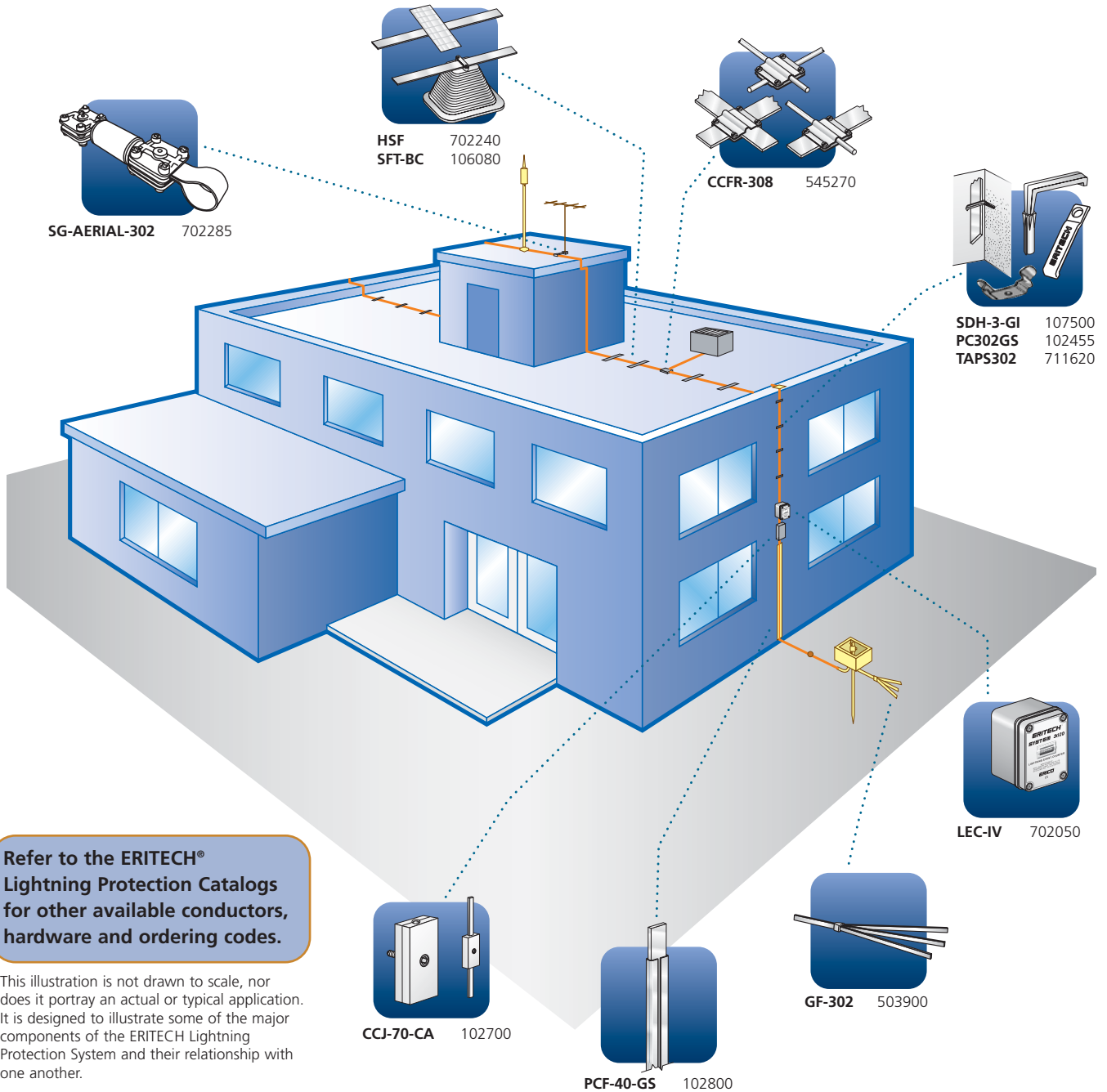
Aerial Spark Gap

SG-AERIAL-302 (702285) 0.5 kg

For the connection of TV and communication masts to the lightning protection systems.



Other Lightning Protection and Grounding Accessories



Refer to the ERITECH® Lightning Protection Catalogs for other available conductors, hardware and ordering codes.

This illustration is not drawn to scale, nor does it portray an actual or typical application. It is designed to illustrate some of the major components of the ERITECH Lightning Protection System and their relationship with one another.

WARNING

ERICO products shall be installed and used only as indicated in ERICO's product instruction sheets and training materials. Instruction sheets are available at www.erico.com and from your ERICO customer service representative. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.

WARRANTY

ERICO products are warranted to be free from defects in material and workmanship at the time of shipment. NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF ANY ERICO PRODUCTS. Claims for errors, shortages, defects or nonconformities ascertainable upon inspection must be made in writing within 5 days after Buyer's receipt of products. All other claims must be made in writing to ERICO within 6 months from the date of shipment or transport. Products claimed to be nonconforming or defective must, upon ERICO's prior written approval in accordance with its standard terms and procedures governing returns, promptly be returned to ERICO for inspection. Claims not made as provided above and within the applicable time period will be barred. ERICO shall in no event be responsible if the products have not been stored or used in accordance with its specifications and recommended procedures. ERICO will, at its option, either repair or replace nonconforming or defective products for which it is responsible or return the purchase price to the Buyer. THE FOREGOING STATES BUYER'S EXCLUSIVE REMEDY FOR ANY BREACH OF ERICO WARRANTY AND FOR ANY CLAIM, WHETHER SOUNDING IN CONTRACT, TORT OR NEGLIGENCE, FOR LOSS OR INJURY CAUSED BY THE SALE OR USE OF ANY PRODUCT.

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ERICO®



www.erico.com



AUSTRALIA

6 Chilvers Road
P.O. Box 148
Thornleigh (Sydney) NSW 2120
Australia
Phone 61-2-9479-8500
Fax 61-2-9484-9188



GERMANY

66851 Schwanenmühle
Germany
Phone 49-6307-918-10
Fax 49-6307-918-150



POLAND

ul. Krzemieniecka 17
54-613 Wrocław
Poland
Phone 48-71-374-40-22
Fax 48-71-374-40-43



BELGIUM

Postbus 33
3110 Rotselaar
Belgium
Phone 32-14-69-96-88
Fax 32-14-69-96-90



HONG KONG

Unit 1, 2nd Floor, Block A
Po Yip Building
62-70 Texaco Road
Tsuen Wan, New Territories
Hong Kong
Phone 852-2764-8808
Fax 852-2764-4486



SINGAPORE

Jurong Industrial Estate
16 Wan Lee Road
Singapore 627 946
Phone 65-6-268-3433
Fax 65-6-268-1389



BRAZIL

R. Dom Pedro Henrique de Orleans
E Braganca, 276
Vila Jaguara
São Paulo CEP 05117-000
Brazil
Phone 55-11-3621-4111
Fax 55-11-3621-4066



HUNGARY

P.f. 184
1476 Budapest
Hungary
Phone 31-13-58-34-547
Fax 31-13-58-35-499



SPAIN

C/Provenza 288, Pral.
08008 Barcelona
Spain
Phone 34-93-467-7726
Fax 34-93-467-7725



CANADA

P.O. Box 170
Mississauga, Ontario
Canada L5M 2B8
Phone 1-800-677-9089
Fax 1-800-677-8131



INDONESIA

Sampoerna Strategic Square,
Tower B 19th Fl.
Jalan Jend. Sudirman Kav. 45-46
Jakarta 12930
Indonesia
Phone 62-21-575-0941
Fax 62-21-575-0942



SWEDEN

Box 211
201 22 Malmö
Sweden
Phone 46-40-611-13-60
Fax 46-40-611-94-15



CHILE

Alcantara 200, piso 6 Of. 17
Las Condes, Santiago
Chile
Phone 56-2-370-2908
Fax 56-2-370-2914



ITALY

A&B Business Center
Via Valla 16, nr. 17
20141 Milano
Italy
Phone 39-02-8474-2250
Fax 39-02-8474-2251



SWITZERLAND

Postfach 54
3280 Murten
Switzerland
Phone 00-800-5000-1090
Fax 00-800-6000-1090



CHINA

Room 1204
Tomson Commercial Building
No. 710 Dongfang Road
Pudong, Shanghai
P.R. China 200122
Phone 86-21-5081-3900
Fax 86-21-5831-8177



MEXICO

Melchor Ocampo 193
Torre A piso 13
Col. Veronica Anzures
11300 Mexico D.F.
Mexico
Phone 52-55-5260-5991
Fax 52-55-5260-3310



THAILAND

163 Ocean Insurance Bldg.
16th Fl. Unit B
Surawongse Road
Bangrak Bangkok 10500
Thailand
Phone 66-2-634-1692
Fax 66-2-634-1694



DENMARK

Box 211
201 22 Malmö
Sweden
Phone 46-40-611-13-60
Fax 46-40-611-94-15



NETHERLANDS

Jules Verneweg 75
5015 BG Tilburg
Netherlands
Phone 31-13-58-35-400
Fax 31-13-58-35-499



UNITED KINGDOM

52 Milford Road
Reading, Berkshire RG1 8LJ
United Kingdom
Phone 44-118-955-0900
Fax 44-118-955-0925



FRANCE

rue Charles Dallière, BP 31
42161 Andrezieux Boutheon Cedex
France
Phone 33-4-77-36-54-32
Fax 33-4-77-55-20-10



NORWAY

Postboks 148
1366 Lysaker
Norway
Phone 47-67-53-12-00
Fax 47-67-12-42-68



UNITED STATES

34600 Solon Road
Solon, Ohio 44139
U.S.A.
Phone 1-440-248-0100
Fax 1-440-248-0723