

Company profile

Design and manufacture of professional antennas
Radiating systems and RF components

1988 ÷ 2026

38 years of design for broadcasting
and professional telecommunications

Italian design since 1988

Antennas, radiating systems and RF components developed around the actual needs of installations.

Our journey

Protel was founded in Milan in 1988 to bring together the design of antennas, radio systems, filters and combiners, and radio-frequency measurements. Founder Roberto Anzelmo brought his experience to the company: Protel's history records over 300 antenna models and more than 1,000 radiating systems already designed when operations began.

Broadcasting has been part of our work since our first projects. Over time, we have expanded into mobile telephony, transport, professional networks, defence and radio-frequency measurements. Our headquarters are in Cesano Boscone, on the outskirts of Milan.

Catalogue products and dedicated projects

We design directional and omnidirectional antennas: dipoles, Yagis, log-periodic antennas, panels and broadband systems. Our range is complemented by RF components and the development of complete radiating systems.

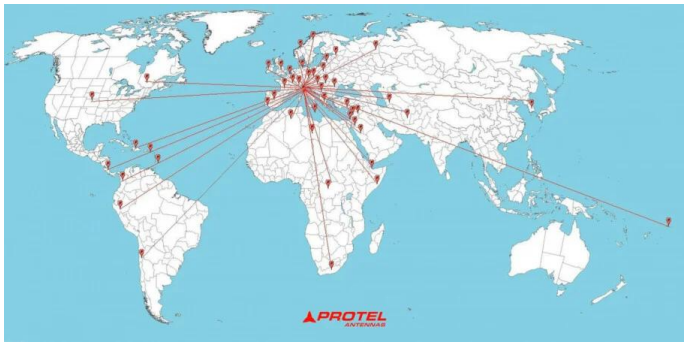
Customer requirements have helped expand our catalogue and led to numerous special projects, including products developed for specific applications and not listed in the general range.

38

years of operation in 2026

Over 200

products in the company catalogue



Company map of direct sales published in 2025.

International presence

Protel antennas are used worldwide in broadcasting, mobile networks and special infrastructure. The company's history documents civil and military supplies and direct sales in various countries.

Direct technical dialogue

Direct discussions with customers link frequency band, radiation pattern, polarisation and installation constraints to the selection of a catalogue product or the development of a dedicated configuration.

Origins and early infrastructure

1988–1998 | Broadcasting, public safety, HF communications and radio coverage in tunnels.

1988 Founded in Milan

Protel was established with an offering comprising antennas, radio systems, filters, combiners and radio-frequency measurements. The company became a supplier to radio networks and local broadcasters. Participation in the International Broadcasting and Telecommunications Show helped promote the brand internationally.

1991 High power FM broadcasting

A pressurisable broadband FM dipole capable of handling 10 kW in continuous operation was designed. Two multichannel systems for twelve FM radio stations were installed on a 96-metre structure in central Milan, with effective radiated powers of 400 and 150 kW respectively.

1993 Public safety and defence

Protel won a tender to supply antennas to the Italian public security forces and became an Italtel supplier. That year, it also supplied antennas to the Italian Army and Italian peacekeeping forces deployed in Somalia.

1994 Mobile telephony in tunnels

Omnitel launched its first mobile coverage installations in motorway tunnels using Protel antennas. This experience opened a sector that would expand into road, railway and metro tunnels and subsequent generations of mobile networks.

1995 HF systems for military stations

The design of two military stations included a large HF log-periodic antenna operating from 5 to 30 MHz. This broadened the company's experience in radiating systems for long-distance radio links.

1996 Expansion of mobile networks

Protel antennas saw increasing use as 900 MHz mobile telephone networks expanded, consolidating the company's work in cellular coverage.

1998 Protelcom established

Protelcom, an associated company, was founded, entering agreements with overseas companies and expanding the offering in DAB, DVB, DVB-T, GSM and DCS technologies. Both companies moved into new offices in Cusago. Cooperation with France's Selecom also began, continuing through later milestones in the company's history.

Measurement and nationwide monitoring

2000–2007 | European tenders, RF measurements, production capabilities and broadcast monitoring systems.

2000 Supply through a European tender

Protel secured a supply contract for the Italian telecommunications administration: dozens of mobile systems for mapping and measuring radio broadcast transmitters. Field measurement became a significant part of the company's experience.

2003 Project with Audemat

Protel and Protelcom, then Rohde & Schwarz's exclusive Italian representative for broadcasting, began trials with France's Audemat for a national project monitoring FM signals in the 87.5–108 MHz band. That year also saw the supply of the first Rohde & Schwarz multiplexes and encoders for DAB signal broadcasting in Italy.

2004 Mechanical engineering and network monitoring

The acquisition of a company manufacturing mechanical parts with CNC machines expanded production capabilities. BT-Monitoring entered agreements with national and regional radio networks for continuous monitoring of broadcast quality, as part of the project developed with Protel and Protelcom.

2005 HF links for NATO

Significant supplies of the ARL530 rotating broadband log-periodic antenna, operating from 2 to 30 MHz, were delivered for NATO armed forces and international radio links with overseas missions.

2006 Consolidation of the national project

The project with Protelcom, BT-Monitoring and Audemat-Aztec envisaged around four hundred radio and television monitoring stations operating 24 hours a day. Parameters included field strength, signal quality, RDS identification and audio deviation. Monitoring equipment was also supplied to the relevant ministry's regional inspectorates.

That year, the company's history also records supplies of antennas and equipment for Italian Navy ships and increasing use of GSM-R antennas on high-speed railway lines.

2007 Cesano Boscone headquarters

Nationwide monitoring expanded with monitoring antennas installed at Telecom Italia sites among others. Protel strengthened the use of its products by mobile operators and telecommunications companies and opened its Cesano Boscone headquarters.

Innovation and new applications

2009–2026 | Multiband antennas, passive radar, indoor coverage and international development.

2009 Online visibility

Protel's online presence exceeded two hundred thousand page views. The website complemented the catalogues in disseminating information about the company's products and applications.

2011 Quad band Yagi antennas for 4G

The company's history records the patent for a range of high-gain quad-band 4G Yagi antennas, broadening the directional solutions dedicated to mobile networks.

2012 Transport and passive radar

The offering expanded from tunnel antennas to panels for base stations. Cooperation with Selecom included mobile coverage solutions for high-speed trains based on the Long Cell system. Protel also completed the design and began production of the receiving-system antenna for a transportable passive radar developed by the Finmeccanica group.

2013 Indoor radio coverage

The design and supply of mobile telephone coverage for large properties, including shopping centres, hotels and offices, became an established activity.

2016 European metro systems

Deliveries of hundreds of high-gain antennas began for the metro system of a major European city, continuing the company's work in transport infrastructure.

2019 Antennas for demanding environments

International operators increasingly used Protel antennas for mobile telephone coverage in tunnels. The range included flame-retardant versions, with attention to materials and long-term reliability.

2025 Direct sales worldwide

International presence was illustrated by the company's direct sales map, documenting the use of Protel antennas in different countries. Major projects that year included radio coverage for the Osmaneli–Bursa railway section in Turkey, the Fréjus tunnel between Italy and France, and Minneapolis Airport in the USA.

2026 Thirty eight years of operation

Protel celebrates 38 years of operation. The company catalogue includes over two hundred products, complemented by special projects and radiating systems developed to meet customer requirements.

A range for all major radio services

Protel's experience encompasses broadcasting, mobile networks, infrastructure, professional services and radio-frequency monitoring.



FM and DAB
Sound broadcasting



TV and DVB-T
Television broadcasting



Mobile telephony
LTE 4G 5G MIMO



Tunnels and DAS
Dedicated coverage



Railways
GSM-R and FRMCS



Professional networks
TETRA PMR DMR



Aviation
ATC and ground-air-ground



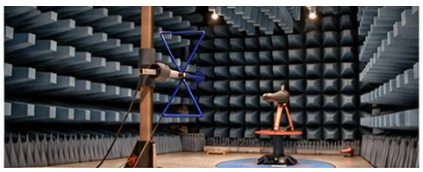
Defence
HF and special systems



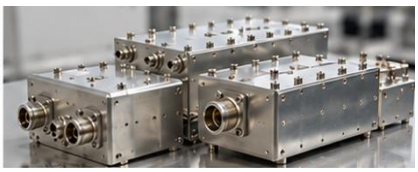
Industry and offshore
Installations and radio services



Wireless broadband
WLAN and WiMAX



Measurement and EMC
Radio monitoring



RF components
Filters and combiners

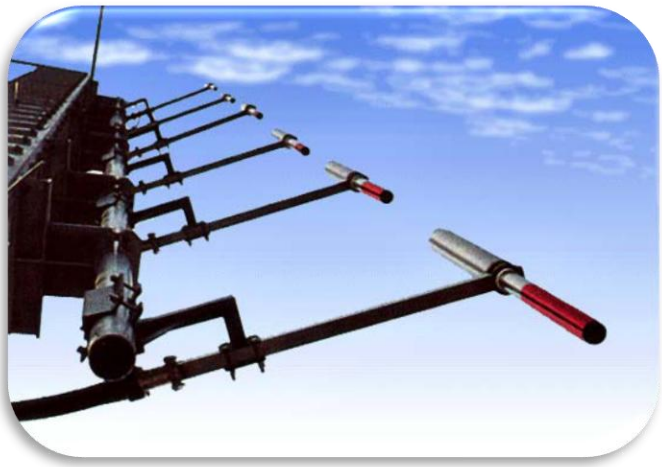
Special solutions and associated services

The sectors shown are complemented by indoor coverage, marine applications, passive radar and dedicated projects. The range includes mechanical accessories, transport systems, supports and measurement options, as well as assembly-kit antennas under the AntennaKit brand.

The following pages describe each area, distinguishing broadcast antennas from measurement products and the components required for RF integration. Available types include dipoles, ground planes, Yagis, log-periodic antennas, panels, radome-protected antennas and complete radiating systems.

FM and DAB antennas

Solutions for sound broadcasting, antenna systems, and signal monitoring and radio surveillance.



FM dipoles and a collinear configuration from the Protel catalogue.

FM broadcasting

The 87.5–108 MHz band is one of Protel's long-established areas. The range includes dipoles, panels, Yagis, log-periodic and ground-plane antennas for broadcast installations, auxiliary systems and monitoring.

Dipoles can form the basic elements of collinear systems. The catalogue includes pressurisable models, while panels and directional antennas support configurations matching the required radiation pattern. Design considers power, polarisation, feed networks and mechanical robustness together.

Experience in multichannel systems

The 1991 FM installations and subsequent work monitoring radio networks connect the design of broadcast systems with verification of signals in the field.



ARL03810X DAB log-periodic antenna. Image from Protel's online catalogue.

DAB broadcasting

For digital sound broadcasting in Band III, Protel offers dipoles, Yagis, panels and omnidirectional or directional configurations. The actual frequency band and configuration depend on the model and the channels planned for the installation.

The design must relate the coverage pattern, polarisation and array integration to the RF feed network. The broadcasting range is complemented by DAB antennas for monitoring stations and mobile vehicles.

An offering that includes measurement

The FM and DAB families address verification and monitoring needs alongside transmission. Directional, omnidirectional and portable products are available for different operational settings.

TV antennas and DVB T systems

Panels and directional antennas for television installations and dedicated signal measurement solutions.



ARP45813.Z UHF broadcast panel and ARP400 antenna. Images from the Protel catalogue.

Panel systems

The television offering includes UHF panel antennas and broadband models. The catalogue describes solutions with in-phase dipole arrays, including configurations available with mixed polarisation.

Antenna selection must consider channels, usable bandwidth, power, radiation pattern and installation conditions. The range supports the evaluation of directional systems and array configurations according to the coverage design.

Log periodic antennas

Log-periodic antennas for the television band provide another family for directional applications. Radome-protected models complete the offering for UHF installations.



ARP4512XZ antenna for small DVB-T repeaters and gap fillers.

Repeaters and dedicated sites

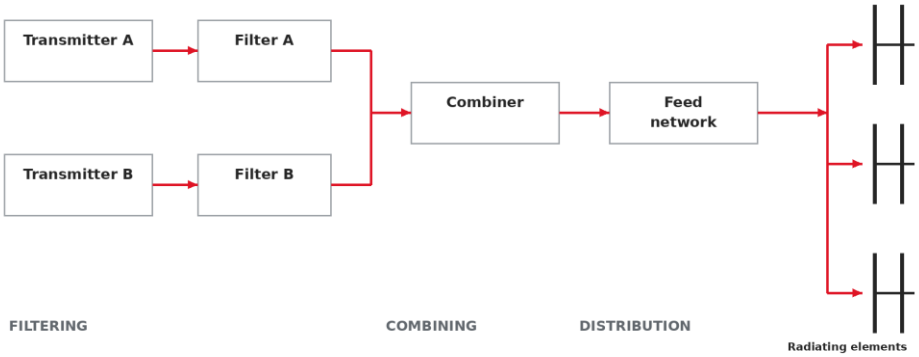
The catalogue includes models for small DVB-T repeaters and gap fillers, alongside antennas for technical sites and dedicated installations. The RF interface and mechanical configuration must match site conditions.

Television monitoring

The measurement range includes directional antennas for monitoring UHF TV signals. The broadcast measurement catalogue presents models in the 470–700 MHz band for fixed stations and operational work.

Integration of transmitters and antennas

Filters, combiners and feed networks complete the design of the radiating system.



Conceptual architecture of a multichannel broadcast system

Filters and combiners

For FM broadcasting, the catalogue includes dual-cavity bandpass filters and star-point and double-bridge combiners, in configurations for different power levels.

The RF range also includes hybrids, splitters, dividers and directional couplers, with families for different bands and services. Component selection considers frequency, power, losses, isolation and connectors.



Protel 87.5–108 MHz FM combiners. Left: star point; right: double bridge.

Complete radiating systems

Design goes beyond the individual element. The overall radiation pattern depends on antenna arrangement, phase relationships, power distribution and installation conditions.

Protel develops complete radiating systems and customised solutions based on customer or site requirements. This allows coordinated assessment of antennas, RF lines, supports and signal distribution.

A clearly defined design

Frequencies, polarisation, radiation patterns in both planes, power and interfaces are the starting points for technical discussions. Drawings and data sheets for the selected model make the proposed configuration explicit.

Antennas for radio frequency monitoring

Fixed stations, mobile vehicles, interference detection and verification of broadcast and telecommunications signals.



Transportable antenna system with carrying case, from the 2026 catalogue.

Measurement and radio monitoring

The range includes omnidirectional and directional antennas for FM, DAB, UHF TV and broadband observation. The measurement and monitoring catalogues cover families extending up to 6 GHz, depending on the model.

Configurations include fixed monitoring stations, vehicles and portable applications. Foldable or quick-fit elements, supports and cases meet transport and operational requirements.

EMC and interference detection

Measurement antennas and accessories are used in RF checks, field-strength measurement and interference detection. Selection considers the band to be observed, directivity, polarisation and the instrument interface.



Typical ARL80R/F1500XZ gain curve published in the Protel catalogue. The graph relates to this model.

Technical data for measurement

Range data sheets provide electrical and mechanical parameters, patterns and, where applicable, useful measurement data. Model documentation connects antenna selection to the type of check to be performed.

Accessories and services

The offering includes polarisation options, insulating supports, mechanical adapters, amplification and transport equipment. Products are complemented by RF measurement, interference detection and radio and television coverage verification services presented by Protel on Radiomisure.it.

Antennas for cellular networks and MIMO

Directional, omnidirectional and multiband solutions for professional radio coverage.



Directional mobile telephone antenna from the Protel catalogue.

From early networks to current applications

Experience in mobile coverage developed in the 1990s, accompanying the evolution from GSM and DCS to UMTS, LTE, and 4G and 5G applications in bands compatible with the model.

The range includes Yagis, log-periodic antennas, panels and radome-protected antennas, with configurations for different bands and services. MIMO and multiband solutions address integration requirements in mobile systems.

Design for coverage

Directivity, polarisation, bandwidth and radiation pattern must match the radio design. Configuration selection also considers dimensions, supports, interfaces and environmental conditions.



Example of a log-periodic antenna for mobile networks.

Special coverage

The catalogue and application areas include antennas for infrastructure, DAS systems, repeaters and dedicated coverage. Radome-protected versions and high-gain solutions broaden installation possibilities.

Multiband experience

The quad-band Yagi range described in the company's 2011 history is a milestone in the development of antennas for mobile services. Special projects and customer requirements contributed to the subsequent expansion of the range.

The service to be covered, operating frequencies and radio-system characteristics guide the choice of model and configuration.

Tunnels railways and metro systems

Coverage in confined environments, railway communications and integration into distributed radio systems.



Radome-protected antenna for dedicated radio coverage.

Road and railway tunnels

Protel antennas are used for mobile telephone coverage in motorway, railway and metro tunnels. The sector began with the first installations in 1994 and expanded to subsequent generations of mobile services.

In confined environments, radiation direction, signal distribution and mechanical compatibility with the infrastructure are key. Protel presents antennas for DAS, repeaters and special coverage systems according to the installation configuration.

Materials and protection

The company's history includes supplies in flame-retardant versions. Materials, protective features and specifications of the proposed version form part of the product's technical definition for the infrastructure.

GSM R and FRMCS

Railway communications are a dedicated area of the current range. Protel presents antennas and RF solutions for GSM-R and FRMCS, with applications in railway networks, high-speed lines, tunnels and DAS systems.

Antenna selection considers the service's actual band, the radio system and installation constraints. The company's history records increasing use of GSM-R antennas on high-speed lines as early as 2006.

Metro systems and high speed rail

Deliveries of hundreds of high-gain antennas for Berlin's metro system began in 2016. The longstanding cooperation with Selecom, dating from 1998, also includes mobile telephone coverage solutions for high-speed trains.

Infrastructure integration

Experience in tunnels and transport supports projects where RF performance and installation are closely linked. Antennas, passive components and feed networks must be assessed within the context of the coverage system.

Radio services for operational communications

Antennas for TETRA, TETRAPOL, PMR and DMR, air traffic control and ground air ground communications.



Panel antennas for civil, military and TETRA services, from the Protel catalogue.

Professional radio networks

The range includes antennas for TETRA, TETRAPOL and professional services in compatible bands, alongside the PMR and DMR applications described in the company's application areas.

Dipoles, Yagis, log-periodic antennas, ground planes and panels address different coverage requirements. Broadband models, stainless-steel solutions and radome-protected versions are available.

Public safety and industry

Professional networks are used in civil, industrial and security services. Selection must consider system frequencies, polarisation, power and installation conditions, as well as the required directivity.



ARS1 phase-variation antenna system for the aviation band.

ATC and ground air ground communications

Protel presents VHF antennas for air traffic control and ground-air-ground communications. The range includes omnidirectional and log-periodic antennas, panels and dedicated systems.

Published products include phase-variation systems and models for airport operational services. Bands and configurations are defined in each model's data sheet.

Aviation monitoring

Antennas for airport services complement families for radio monitoring and interference detection. Technical documentation relates the antenna and instrumentation to the site's requirements.

Antennas for military communications

HF systems, broadband links and projects dedicated to armed forces requirements.



Installation of a Protel ARL531 antenna system on a tower at a military base.

From design to installation

Defence applications include large HF antennas, broadband systems and dedicated configurations. Design relates radio performance, mechanical structure and site operating conditions.



Italian Army radio communications tower in an operational setting.

Experience with the Army and NATO

Protel supplies antennas to the Italian Army and peacekeeping forces deployed in Somalia. In 1995, it built HF systems in the 5–30 MHz band for two military stations.

In 2005, NATO supplies of the ARL530 family in the 2–30 MHz band supported international links with overseas missions. The company's history also records supplies for Italian Navy ships.

Special receiving systems

Experience also includes the receiving antenna for a transportable passive radar developed by the Finmeccanica group, designed and put into production in 2012.

Antennas for special installations and missions

HF communications, receiving systems, and military, industrial, marine and offshore applications.



Large HF log-periodic system from the Protel catalogue.



Example of an omnidirectional antenna for marine applications.

HF communications and defence

HF and broadband antennas are used in civil and military radio links. The company's history includes supplies to the Italian Army and peacekeeping forces, HF systems for military stations and NATO supplies.

The ARL530 family is associated with international links to overseas missions in the 2–30 MHz band. This sector also includes projects dedicated to special installations and configurations.

Passive radar

In 2012, Protel completed the design and began production of the receiving-system antenna for a transportable passive radar developed by the Finmeccanica group, one of the specialist projects described in the company's history.

Marine and offshore applications

The company gallery documents installations on offshore platforms and antennas for mobile services in marine environments. The company's history also records supplies for Italian Navy ships.

Industry and infrastructure

Applications include radio services for industrial sites, energy, utilities and infrastructure. Technical discussions relate antenna selection to system requirements, environmental conditions and mechanical constraints.

Projects to specification

These installations may require dedicated geometries, protective features and interfaces. Experience in special projects supports the evaluation of configurations beyond selecting a single catalogue product.

Connectivity and dedicated coverage

Antennas for wireless broadband, buildings and professional assembly-kit configurations.

WLAN Wi Fi and WiMAX

The published range includes antennas and RF components in the 2300–5850 MHz range for WLAN, Wi-Fi, WiMAX and wireless broadband, with further uses in bands compatible with the service and model.

Directional antennas, panels and omnidirectional solutions address different radio configurations. Selection starts with the frequencies, polarisation, gain and radiation pattern required for the installation.

Links and private networks

Wireless applications include private networks, radio links and technical infrastructure. Design must consider integration with equipment, RF lines and installation supports.

Coverage inside buildings

The design and supply of indoor coverage is an established activity, with applications in shopping centres, hotels and offices. Current areas include DAS and dedicated mobile telephone coverage.

AntennaKit

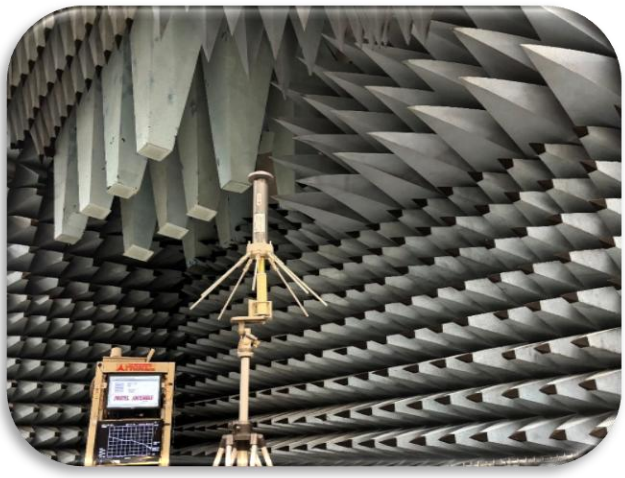
AntennaKit is Protel's brand for professional antennas supplied as assembly kits. It complements the offering with models and accessories for VHF and UHF applications, according to the published families.

Installation accessories

Brackets, supports, adapters and RF components complete the antenna system. Selection must maintain consistency between electrical requirements, antenna geometry and conditions at the installation point.

RF development and mechanical construction

The product takes shape through consideration of radio performance, materials and operating conditions.



Tests in the in-house anechoic chamber, from Protel technical documentation.



Transportable system and arrangement of elements in the carrying case.

RF design

Activities cover operating band, impedance matching, gain, polarisation and radiation patterns. Radiating systems also involve element arrangement and the feed network.

Mechanical design considers dimensions, materials, protective features and supports. Production photographs and catalogues show stainless-steel antennas, radome-protected products and families with different construction geometries.

Mechanical capabilities

The 2004 acquisition of a company described in Protel's history expanded mechanical-parts production through CNC machining. The range also extends to telecommunications accessories.

Testing and documentation

Company documentation includes anechoic chamber tests, electrical patterns and photographs of vibration tests. These activities illustrate the relationship between design, RF response and mechanical behaviour.

For supplies defined by a specification, the verification plan must refer to the proposed model and configuration. Technical data sheets and drawings are the starting point for comparison with customer requirements.

Operational use

Foldable elements, quick-fit connections, insulating supports, polarisation options and cases form part of the measurement offering. Ease of assembly and transport is considered alongside antenna characteristics.

A partner for antenna supply

Broadcasting experience, RF design and a range spanning multiple sectors.

Relevant expertise

Our offering includes FM, DAB and TV antennas, radiating systems, RF components and measurement products. Multichannel installations and broadcast monitoring are concrete parts of the company's history.

The range supports the assessment of catalogue antennas and dedicated configurations. Experience in infrastructure and special installations contributes to discussions about installation constraints and operating conditions.

From specification to configuration

Proposals start from the consultation requirements: band, channels, power, polarisation, patterns, RF interfaces and mechanical constraints. Data sheets and drawings clarify the configuration of each selected model.

Products and systems

Discussions can cover a single radiating element or a complete antenna system, with the filtering, combining and feeding components required by the installation architecture.

Protel Antennas

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Information about the range

The company website brings together product families, technical data sheets and application documentation. This presentation outlines Protel's history and activities; supply specifications are those of the proposed model and configuration.