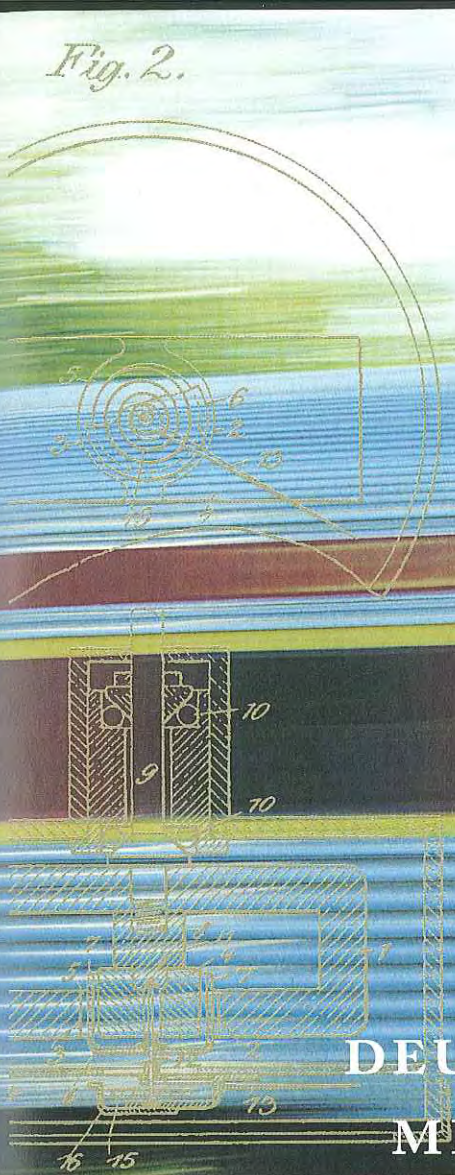


DEUTA – A 100 YEARS OF SPEED MEASUREMENT AND CONTROL

Deuta-Werke, based in Bergisch Gladbach is a medium-sized company operating world-wide with some 270 employees. Its business consists in developing, manufacturing and distributing innovative components and systems. The major fields of application for the wide product range are rail and motor vehicles and industrial process automation.

DEUTA-WERKE

OUR STRENGTH IS PERFORMANCE

For train control and safety engineering, Deuta supplies from Bergisch Gladbach components and systems for monitoring and controlling speed. In addition to intelligent sensors, these include indicating instruments and display units which provide the driver not only with details of actual and recommended speed, but also route information and drive system diagnostics.

Deuta additionally supplies systems consistent with the latest safety standards which can be integrated into the central vehicle control system. The next strategic step towards becoming a subsystem supplier is already being embarked on with the offer of integrated drivers' desks and speed and distance unit for maximum safety.

DEUTA-WERKE
BERGISCH GLADBACH

Besides vehicle manufacturers, customers also include operators such as national, regional and private railways. In metal turning and milling centres, the Schwarzenbach-am-Wald subsidiary plant in Upper Franconia manufactures mechanical precision parts for automotive component suppliers. This plant also makes parts for the parent factory in Bergisch Gladbach and supplies other customers in various industries.


SHANGHAI
BERGISCH GLADBACH
COLOGNE
SCHWARZENBACH
NUREMBERG
MUNICH
GERETSRIED

DEUTA-WERKE

SCHWARZENBACH AM WALD

DEUTA-WERKE

GERETSRIED

DEUTA-WERKE

SHANGHAI

A powerful and modular product range of industrial and panel PCs and display units comes from Geretsried. They are used for monitoring and providing visualised displays for industrial machinery and plant.

With an eye to the future, Deuta has established itself in the Chinese market with a joint venture in Shanghai. In future, the subsidiary will not only supply Chinese customers with transmitters, indicators and incident recorders, but will also provide services in the engineering and production fields for the entire Deuta Group.

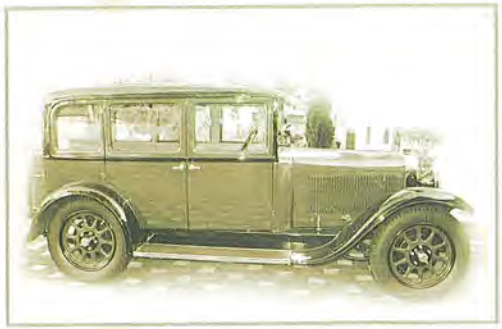
EXPERTISE OUT OF EXPERIENCE

DEUTA`S CONTRIBUTION TO MODERN TRAIN DRIVERS` DESK

Innovation and tradition have walked hand-in-hand in the company's 100-year history. Due to the expertise of its staff and reliability of its products Deuta engineers have been asked to take part in a number of international working groups concerned with standardisation and specifications. Familiarity with country-specific standards and approval procedures is today as much part of the company's accumulated experience as is knowledge of the latest technology and an in-depth understanding of the fields of application and the particular conditions which apply in them.

A pronounced sensitivity in matters of system integration and project coordination in collaboration with our business partners forms, in conjunction with a strong awareness of appropriate risk management, the basis for handling ambitious projects.

Deuta-Werke achieves today an annual turnover of about 35 million Euros world-wide. The profits generated remain predominantly within the company. They provide the basis for enduring viability, making possible as it were innovative investments such as appropriate provision for contingencies. The capital-to-assets ratio of over 50 % is also an expression of prudent company policy.



AT THE BEGINNING OF THE AUTOMOBILE

100 years of Deuta-Werke – that is not just a remarkable piece of Federal German company history, but also an interesting piece of contemporary history. Two world wars, rapid technical developments and momentous social changes are also reflected in the company chronicles.

At the beginning stood the car. In 1905, in an age of blossoming industry and an atmosphere of innovation and change the Deutsche Tachometerwerke GmbH came into existence in Berlin. The founders were Georg Rensch, an engineer from central Berlin, the Charlottenburg merchant Max Steinberg and the Schöneberg industrialist Max Tritter.

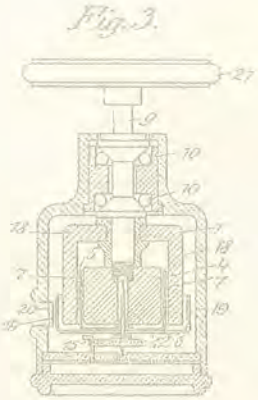
GEORG RENSCH (1874 – 1948),
CO-FOUNDER OF DEUTSCHE
TACHOMETERWERKE GMBH IN BERLIN

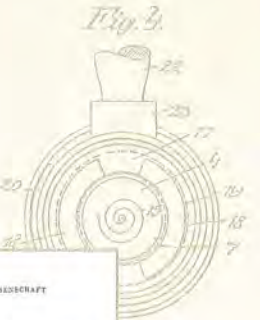
THE TACHOMETER AS BUSINESS IDEA

On 1st March 1905, the company was entered in the Commercial Register; production could now start on the company's site on Belle-Alliance-Strasse. The focus for the founders was the exploitation of a patent for a "speedometer with rotating magnetic element and an indicating element connected to an armature which is influenced by the generated eddy currents".

The car may have been still at the start of its development, but it was not only in the city of Berlin that the hazard posed by the new means of transport was growing. The first idea was to limit the speed in towns and cities to 30 kph, but to do this it was first necessary to be able to measure speed and indicate it to the driver. Deuta developed a tachometer which worked without a time-lag and with great accuracy – and provided the basis for the company's world-wide recognition.

Imperialism and colonialism had also prepared the ground for a policy of economic expansion. In this context, the name Deuta came to be synonymous within and beyond Germany for precision and robustness in motor-vehicle speedometers. In their vehicles, even the German Emperor and the British royal family relied on the still young Company's indicating equipment. Only four years after the company's foundation the 10,000th tachometer was sold; Deuta agencies in Paris and London were an expression of its growth business policy and international acceptance.





SCHWEIZERISCHE EIDGENOSSENSCHAFT

EIDGEN. AMT FÜR GEISTIGES EIGENTUM

PATENTSCHRIFT

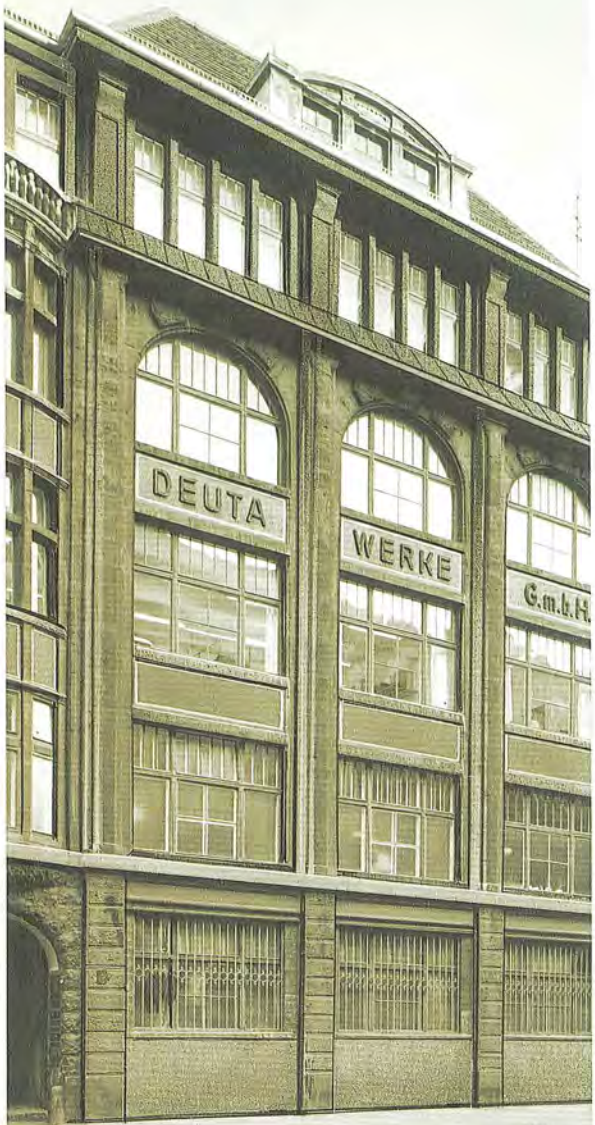
Patent Nr. 35461 Klasse 61

Deutsche Tachometerwerke G. m. b. H. in Berlin (Deutschland).

Geschwindigkeitsmesser.

BASIS FOR SUCCESS:

THE 1905 TACHOMETER PATENT



Demand came however not just "from the roads". Steam locomotives were in service as transport vehicles as were the first electric railways. Air travel too was getting off the ground.

Much was on the move at that time – even in Deuta's management. The company was not yet a year old when partner and authorised signatory Georg Rensch was appointed managing director. Max Steinberg had sold his shares in the business to him. A year later Viktor Körting, an engineer from Wilmersdorf, joined the management team. In 1909, another of the founding managers, Max Tritter, was dismissed.

In 1910, the company's base was moved to a new building in Oranienstrasse. The premises were initially rented but as the business expanded – the entire block of buildings was purchased in 1921 – they were regarded from then on as the company's headquarters. At the same time, the need was felt for a short and easily remembered company name. On 6th November 1911, Deutsche Tachometerwerke became the Deuta-Werke.

1910

THE COMPANY BASE MOVES TO ORANIENSTRASSE

RENAMING: DEUTSCHE TACHOMETERWERKE BECOMES DEUTA-WERKE

FUTURE MARKET – RAILWAY

After a serious railway accident the demand for speedometers for rail vehicles also became major issue, and Deuta-Werke again had a patented solution ready. On the basis of the eddy-current principle and two patents, Georg Rensch developed and perfected the "drive shaft locomotive speedometers". Very soon Deuta became the principal component supplier to German Imperial Railways. A new product field had opened up for the company on the railways which was years later to develop into its core business.

There were also changes again in the boardroom. In May 1920, the retired corvette commander Baron Wedig von Keyserlingk was appointed to the management team. A strong leader was needed to complement Paul Hesse, an engineer from Rixdorf, and chartered engineer Wilhelm Berkmann, and it was natural to seek one in the military field. The former corvette commander proved not only strong but also durable. For an impressive four decades he directed the company's fate together with a series of different technical managers.


GEORG RENSCH in BERLIN.

Antriebswelle für Lokomotiv-Geschwindigkeitsmesser.

Klasse 42a.

KAIS. KÖNIGL. PATENTAMT.

Österreichische

PATENTSCHRIFT Nr. 69260.

STRONG PERSONALITY:
BARON WEDIG VON KEYSERLINGK
IS APPOINTED TO THE MANAGE-
MENT TEAM

GROWTH AND INNOVATION GO HAND IN HAND

At the end of the "Golden Twenties" Deuta-Werke was well positioned in the automotive and railway business. For motor vehicles preassembled panels with indicating instruments were already being supplied. The wish for further growth and the technical progress in the use of electric measuring devices led to the takeover of "Nadir", a firm well-known for its electric laboratory instruments. Deuta thereby added electric tachometers to its product range as an alternative to devices driven by a flexible shaft.

An early example of the synergy effect brought about by company merger was the founding of V.D.O.-Tachometer AG Frankfurt in May 1929. At times of fierce competition several automotive component suppliers shared the market for motor-vehicle tachometers, which were being fitted in just 48,000 new vehicles every year. Therefore, the competitors Andreas Veigel from Stuttgart-Canstatt, Deuta-Werke in Berlin and OTA Apparate GmbH in Frankfurt sought to combine to form V.D.O. Veigel dropped out however and later went bankrupt – the name V.D.O. remained and stood from now on for "Vereinigte Deuta-Ota" ("United" Deuta-Ota). OTA, which later likewise went into liquidation, distributed its assets to its shareholders Adolf Schindling and Georg Häusler.

FORMATION OF V.D.O.-TACHOMETER AG FRANKFURT: SUCCESSFUL COLLABORATION BETWEEN DEUTA WERKE AND OTA APPARATE GMBH

DEUTA SUCCESSFULLY ENTERS AERONAUTICAL ENGINEERING

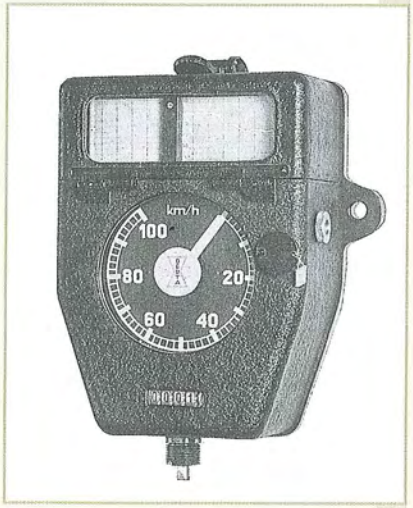
The two shareholders brought in the cash capital, and Deuta all of the automotive components, the expertise, the production and customer base. V.D.O.'s roots thus lie in the early history of Deuta-Werke.

INNOVATION IN TRAIN PROTECTION

The mid-20s saw the beginning of a crucial new departure on the railways when German Imperial Railways commissioned Deuta-Werke to develop a device which monitored not only speed but also braking performance in response to trackside braking points and stop signals. The engineers found a reliable means of implementing this in a sapphire needle which recorded travel data in linear form on waxed paper.

Locomotive drivers would however have preferred to see the monitoring instrument shelved, which later became part of the "INDUSI" inductive linear train control system developed by Siemens. They felt spied on and occasionally even went as far as "inadvertently" damaging the instrument. However, an accident in which the recordings enabled the driver to prove his innocence brought a radical change of heart among locomotive drivers.

In 1937, the WR-line – the first recording tachometer in railway traffic history – was unveiled for the first time at the World Exhibition in Paris and introduced into the Imperial Railways locomotives. The first exports were not long in coming; the state railways in Holland, Austria, Bulgaria, Rumania, Greece, Turkey and Scandinavia, too, wanted Deuta products.

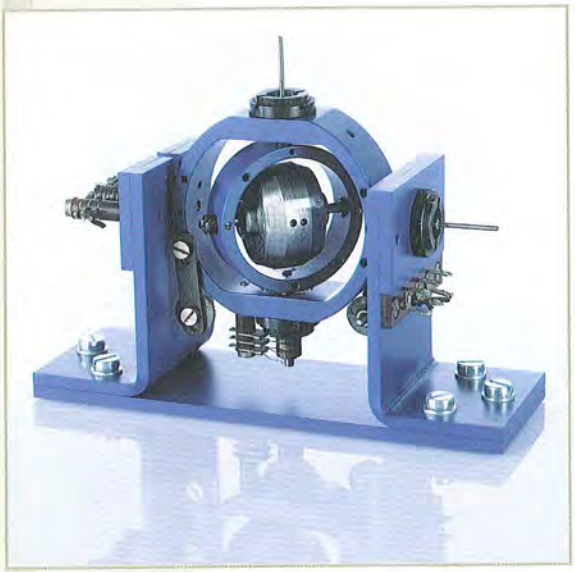


WR 2 – FIRST RECORDING TACHOMETER IN RAILWAY TRAFFIC

1937

AWARD FOR WR-LINE AT THE WORLD EXHIBITION IN PARIS

NEW MARKET – AVIATION



GYROSCOPE BASED ARTIFICIAL HORIZON AS INCLINATION INDICATOR

With the delivery of revolution counters for aircraft, Deuta-Werke had already entered the aviation business before the First World War. However by acquiring Wilhelm Morell Tachometerfabrik KG in May 1930 the company gained a broad spectrum of other products for the aviation industry. Deuta-Morell built among other things "instrument-flying equipment with gyroscope based turn indicators and artificial horizon". Measuring instruments for monitoring engine revolution speed enlarged the repertoire, as did the air-navigation and windspeed fields. In the leisure industry the principle of windspeed measurement has remained virtually unaltered into the present. Sailors and surfers prize Deuta's hand-held anemometers, which are among the best instruments on the market.

During the Second World War, the Reich Aviation Ministry ordered, on the one hand a separation of business segments – V.D.O. for the motor-vehicle sector, Deuta for the rail and aviation sectors – on the other hand a com-

ANEMO

pulsory relocation of Deuta-Werke to Schwarzenbach am Wald in Upper Franconia. Disguised in the Commercial Register as Rensch GmbH, the company moved into the factory premises of the "Cotton Industry Erlangen". The site in Berlin, now severely damaged by bombing raids, was kept on as a subsidiary.

STARTING ALL OVER AGAIN

While the end of the war brought the long-awaited peace, it also brought business almost to a standstill for Deuta-Werke. Business activity in Berlin was tending towards zero, the operating facilities by then established in Burgstädt (Saxony) and Ölsnitz (Vogtland) were confiscated and almost completely dismantled by the occupying powers. American troops occupied the Schwarzenbach plant on 15th April 1945, declared the site a "Reparation Plant" and restricted access to only a few company personnel.

Deuta emerged from the war "like a plucked bird", as the then managing director Baron von Keyserlingk put it. Assets valued at around 14 million Reichsmark and approaching 15,000 manufacturing drawings had gone missing, and of the once over 600 personnel only 44 remained.

RENSCH GMBH AFTER THE END OF THE 2ND WORLD WAR

THE BUSINESS SECTORS AUTOMOTIVE, RAIL AND AVIATION HAVE TO BE SEPARATED

DEUTA HAS TO RENAME ITSELF RENSCH GMBH AND MOVES TO SCHWARZENBACH

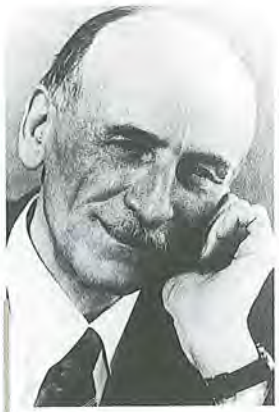
DEUTA-WERKE IN SHEDS

Baron von Keyserlingk and chartered engineer Albert Eisele mustered the courage as directors to start again. Irreversible confiscation by the Americans was successfully prevented and slowly a form of "peacetime production" was got under way which had little to do with Deuta-Werke's true business. Everything post-war households needed for day-to-day living was produced, from cooking pots to stoves, from toys to tools. It was like starting from scratch again: sales in the period from 1st June to 31st December 1945 amounted to just 6,853.03 Reichsmark.

But Deuta picked up speed rapidly. The workforce grew to 200 in the first two years after the end of the war alone. By the time of the currency reform, the opening balance sheet at 21st July 1948 already showed authorised capital of DM 800,000 and a balance-sheet total of some DM 1.5 million. In the same year Rensch GmbH with headquarters in Berlin and regional establishment in Schwarzenbach was renamed Deuta-Werke again.

A NEW LOCATION

Production start-up in Upper Franconia proved problematic, because the "Cotton Industry Erlangen" wanted its plant facilities back, Deuta-Werke had to divert to sheds. But workforce, partners and directors overcame even this obstacle. On 1st April 1950 the company's head office was returned to Schwarzenbach.

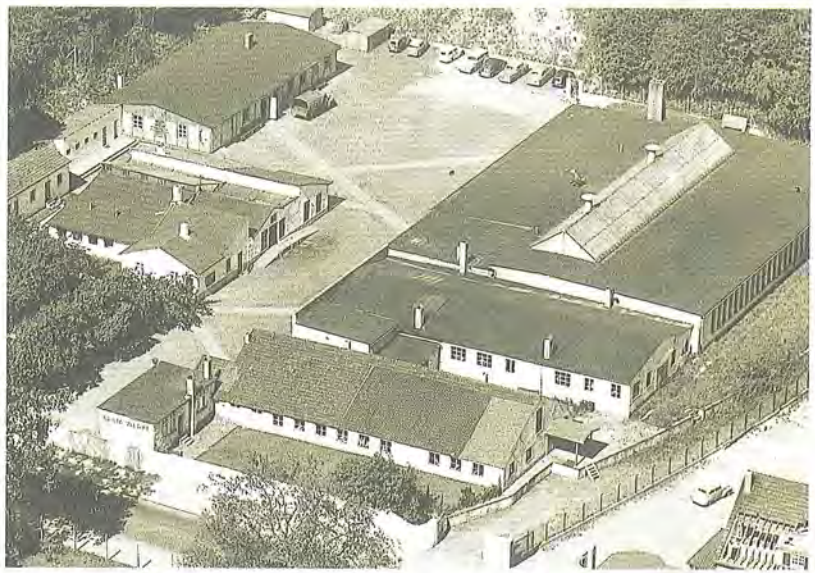


CHARTERED ENGINEER ALBERT EISELE DURING THE RECONSTRUCTION AFTER THE 2ND WORLD WAR

RENAMING BACK TO DEUTA-WERKE GMBH WITH HEADQUARTERS IN BERLIN, BRANCH ESTABLISHMENT IN SCHWARZENBACH

In the effort to rebuild the core business swiftly, the company sought proximity to key customers. Since German National Railways had transferred its headquarters from ruined Berlin to Munich and was placing repair orders with Deuta-Werke, parts of the company likewise moved to the Bavarian metropolis Munich. Development, engineering design, sales and management relocated with around 30 personnel. By 1949, branch establishments had been set up at several locations in Munich in addition to management headquarters.

In the certain knowledge that the Schwarzenbach site did not provide the ideal conditions for long-term expansion of business operations, an additional site was looked for which as well as being close to customers also had better infrastructure links. With its proximity to the Rhine-Ruhr district, with its major locomotive works and favourable transport links Bergisch Gladbach provided good base.



On 13th February 1951, Deuta-Werke purchased from the manufacturer Julius Richter the site and buildings of a soapworks. Transfer of assembly and repair operations started only four months later. By end of 1953, all the Munich operating facilities had been replaced; on 5th May 1960, company head office too was transferred from Schwarzenbach to Bergisch Gladbach. Production of mechanical components remained at Schwarzenbach.

OPENING OF THE COMPANY BASE IN MUNICH

TRANSFER OF THE COMPANY BASE FROM SCHWARZENBACH TO BERGISCH GLADBACH

WOLFRAM RENSCH

A NEW ERA BEGINS

In the 1950s there were far-reaching changes in personnel in addition to the location-related changes. Albert Eisele, who had been part of the firm for 40 years and had worked for almost 20 years as technical director, retired. The Berlin businessman Wolfram Rensch, son of co-founder Georg Rensch, was appointed to the management team. He worked with Baron von Keyserlingk until 1966 and after the latter's retirement took over sole representation of the firm's share holders the management for the subsequent decades.

DEUTA IN THE ECONOMIC REVIVAL

The period of reconstruction and economic revival is also reflected in the balance sheets for those years. The general industrial automation division suddenly became more significant than the railway business. Lastingly, what's more: until well into the 1980s.

Which does not mean that the railway business was faltering. On the contrary: over whole areas national railways were introducing train-control systems for steam and electric locomotives, railcars and city railways. The domestic market above all thus became a mainstay of Deuta's business.

COMMERCIALIZATION OF THE ELECTRIC INCIDENT RECORDER ER 4

WOLFRAM RENSCH BECOMES SOLE MANAGING DIRECTOR

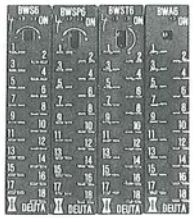
For German Federal Railways' "INDUSI I54" train safety system, the WR 7, an indicating and writing speedometer, was being supplied; a transmission case and a flexible drive shaft also came from Deuta. In exports, the WR 2 was a major sales mainstay. Deuta opened up significant markets in eastern Europe, especially in the former Yugoslavia, Poland and the former GDR.

In the pattern of industrial business, products for controlling and monitoring motors and machinery were in demand. Deuta was active in the fields of drive engineering, Diesel engines/motors, machine tools and textile machinery, supplying among other things a starter lock and an overspeed protector for engines/motors.

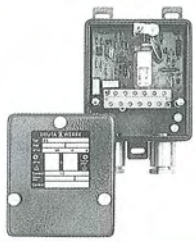
On production machines, Deuta products indicated rotational speed, incidents and production rates and facilitated appropriate control measures when thresholds were reached. The efficiency of machines and the quality and quantity of production could thus be markedly increased.

VIEW OVER THE HORIZON

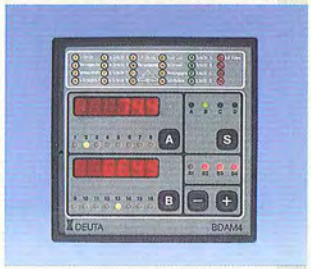
Despite the industrial boom in Germany, foreign markets were often the pacemakers for technical innovations at this time. While in Germany transmitters and electric indicators still predominated in the 1960s, machine builders abroad were already switching over to non-contacting sensors for measuring rotational speed, so generating additional business for the Deuta-Werke product range.



STARTER LOCK

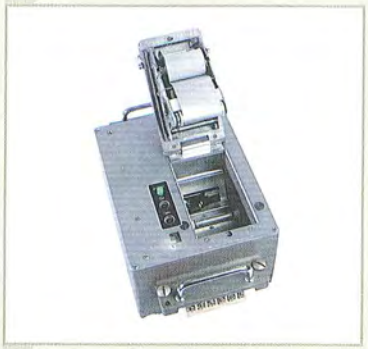


OVERSPEED PROTECTOR

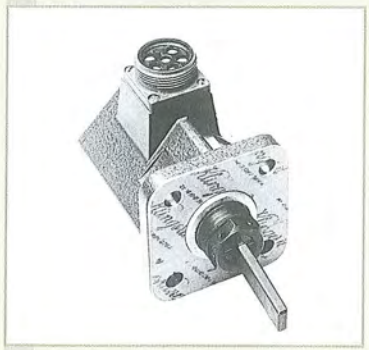


MACHINERY CONTROL

NON-CONTACTING SENSORS



ER 4



EFI 50

ES 70/1

Trailblazing events were also happening on the rails. In 1962, German Federal Railways embarked on the changeover from the INDUSI 154 to the INDUSI 160 train safety system. This involved replacing the drive and speed measurement systems with electric versions. Deuta's contribution comprised the ER 4 electric incident recorder and the EFI 50 electric remote transmitter. Both instruments were also introduced by the Austrian and Yugoslav national railways.

The "DSS" driving safety switch ES 70, popularly known as the "dead man's switch", contributed to greater safety in railway operation. The train driver must at regular intervals demonstrate his alertness by activating it. The 1955 prototype rapidly developed into a successful product which is still part of the product range today.

THE EXPORT BUSINESS GROWS

At the end of the 1950s German railway-vehicle builders were already beginning to transfer production abroad under licence, led to a distinct expansion of export business. The design and manufacturing documents specified the use of Deuta products. At the beginning of the 1960s, the company had already reached the Asian market. In India German-made locomotives were in service, equipped with overspeed protectors from Deuta. At the end of the 1960s, the Bergisch Gladbach company was supplying switching and indicating instruments and incident recorders (ER 6) to South Korea.

Progressive enlargement of route networks and modernisation of vehicle fleets led to new requirements to be met by vehicle systems and components. Development of new products was increasingly marked by standard designs, modular solutions and miniaturisation.

The beginning of the 1970s saw the trend towards standard driver's cabs established. Together with the technical departments at Bundes-Zentralamt (Federal Headquarters), the locomotive personnel and Main Staff Council jointly determined the arrangement of the control and operating elements and also their geometrical dimensions. Over the years, a "Modular Driver's Console Indicator" (MFA) from Deuta came to be specified in connection with the "INDUSI I60" train safety system. In compact form, it provides the driver with centrally positioned indicators of speed, traction and braking force and technical engine data. Its further development took place in the 1980s for the LZB 80 train safety system, suitable for speeds over 180 kph. Indicators were added for distance-to-destination and set/actual speed. Deuta-Werke thus marketed a product which is still successfully in service after more than three decades.

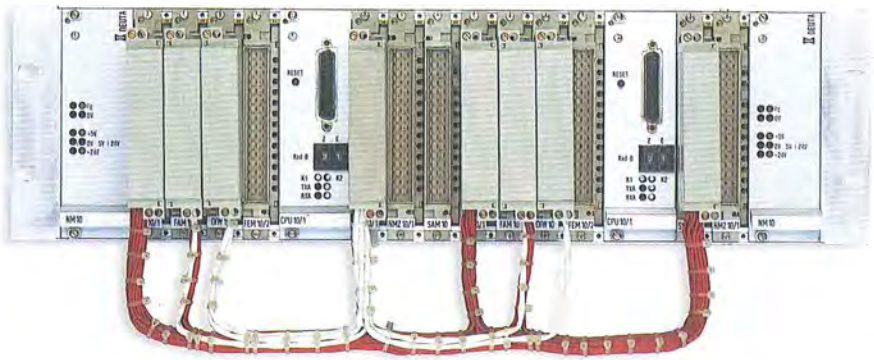
MODULAR DRIVER`S CONSOLE INDICATOR (MFA 8)

COMMERCIALIZATION OF MFA

HIGH-TECH OPENS NEW POSSIBILITIES

"Faster and smaller" was the slogan in the 1980s. Microprocessors opened up new possibilities and also influenced the development of Deuta-Werke's business. While in industrial business terminals for capturing, processing and indicating machine data became more functional and powerful by leaps and bounds, in the railway sector the ZWG speed and distance unit for the ICE 1 signalled entry into a new field in high-speed transport. Higher speeds of travel and increased train density made higher demands on reliability and precision. The KWR 1 "short-distance incident recorder", which records travel data like the black box in an aircraft and can be used for analyses after accidents, also established itself.

KWR 1: FIRST DATA RECORDER BASED ON MICRO PROCESSOR TECHNOLOGY IN RAILWAY TRAFFIC



ZWG – SPEED AND DISTANCE UNIT

ZWG – SERIES PRODUCTION FOR ICE 1

FOR GREATER SAFETY

The 1990s saw far-reaching changes in technological fields, business structures and production processes. From then onwards, the ER 24 electronic incident recorder, a new development, prevented the train driver from further accelerating the train after overrunning a signal. The recorder outputs a warning to the driver and, if necessary, applies the train brakes automatically.

After an extended development period, German Federal Railways retrofitted the new system to its old vehicles from 1998 onwards; new vehicles were fitted with the Deuta system, so that safety was improved for more than 4,000 vehicles. Economic advantage also played a part here, since the ER 24 was a design-compatible replacement for the ER 4. In parallel with this, in 1996 radar technology was developed. Here, Deuta was one of the first companies to make this a practical method for measuring speed and distance in railway operation.

ER 24

DRS 05 MOUNTED UNDER THE SUPERSTRUCTURE OF A RAIL VEHICLE

FOUNDATION OF THE JOINT VENTURE SHANGHAI
DEUTA ELECTRONIC & ELECTRICAL EQUIPMENT CO., LTD.

As a moderately large production order, the ER 24 made particular demands on logistics and manufacturing. As part of the overall business plan, the essential conditions had been met. Deuta had introduced a Total Quality Management System and embarked on the changeover to process-oriented organisation.

MANUFACTURING ISLANDS

DIN ISO 9001 set the standards in 1994 for a modern Quality Management System; three years later group working and process-oriented work sequences replaced the previous organisational structures and made Deuta fit for increased customer expectations and tougher competitive conditions.

ULTRA-MODERN STRUCTURES

AUTOMATIZED IN-LINE ASSEMBLY

The key elements in the process approach concerned production, logistics and development at Bergisch Gladbach. Production, which had hitherto grown in a department-oriented way, was now arranged by process-oriented production lines. The production premises had earlier been used by Krico, an industrial company taken over by Deuta in 1970 and eight years later merged with Deuta. It had produced thickness-measuring equipment for foil and plate goods. At the

beginning of the 1990s, this field had however been abandoned in order to concentrate on the core business.

Space had thus been created for the four manufacturing islands "electronic modules", "indicating instruments", "sensors" and "system assembly". Modern warehouse systems, manufacturing and testing equipment, lean production management, decision-making process teams with the physical proximity of logistics, purchasing and production soon resulted in rapid improvement in throughput times, quality and economic efficiency. Only six months after the plans had been finalised, the conversion and changeover to a new computerised data-processing and product-planning system had already been completed – with business operations continuing, moreover. Also reorganised on the basis of product lines and technology was the research & development section, the staffing of which was moreover upgraded in the following period.


TÜV CERT

ZERTIFIKAT

Die TÜV CERT-Zertifizierungsstelle der TÜV Anlagentechnik GmbH,

bescheinigt gemäß TÜV CERT-Verfahren, daß das Unternehmen

DEUTA-WERKE GmbH
Paffrather Str. 140
D-51465 Bergisch Gladbach

für den Geltungsbereich

Anzeiger, Spezialgeräte und Sensorik für Schienenfahrzeugausrüstung und Industrie

DIN EN ISO 9001:1994

TÜV

STANDARDIZATION ACCORDING TO DIN ISO 9001 AND IMPLEMENTATION OF GROUP WORKING

CHANGING GENERATIONS IN THE COMPANY

There was also reorganisation in management. After more than 40 years with the firm Wolfram Rensch relinquished his responsibility as director on 1st January 1994 and passed it on to his successors. Physicist Dr. Neil Stuart Craigie and Felix Kirchgässler, who graduated in business administration, moved to the top floor. Rensch has remained associated with the firm to the present day, as shareholder and as consultant.

Throughout its company history Deuta has always seen itself as an innovative company and one of the trend-setters. Its ability to take on the constant changing technologies and, not least, resulting new tasks and challenges, led at the end of the 1990s to a plan to develop the company into new dimensions.

DR. NEIL CRAIGIE

FELIX KIRCHGÄSSLER

WOLFRAM RENSCH RELINQUISHES
MANAGEMENT OF THE BUSINESS TO
DR. NEIL CRAIGIE AND FELIX KIRCHGÄSSLER

COMPETITION INTENSIFIES

In the years leading up to it, privatisation of German Federal Railways had already brought about a distinct intensification of competition and of pressure on profits in rail-transport technology, the strongest business segment since the beginning of the 1990s. In an area of tension between unequal powers and divergent interests Deuta has since then repeatedly had to actively re-position itself.

Through high flexibility and customer-oriented, technically competent advice and service, Deuta maintains its position as a reliable partner among its customers including the main operators such as German Federal Railways and worldwide operating corporations of the railway supply industry.

Deuta meets the ever shorter lifecycles of products and subassemblies with carefully thought through engineering which has an eye to the long term requirements on the one hand and ever short availability of components on the other. It is accomplishing this through its continuously improving and expanding "obsolescence management" system. Locomotives and traction vehicles have a service life of about 30 years; however the modern innovative control systems have electronic components which become obsolete and no longer available after only five years. In this context, an integrated planning,

1996

ESTABLISHMENT OF RADAR TECHNOLOGY TO MEASURE VELOCITY ON RAIL VEHICLES

1997

INTRODUCTION OF PROCESS-ORIENTED COMPANY ORGANISATION AND ALTERATIONS TO THE BERGISCH GLADBACH PLANT

TURNING AND MILLING CENTRE AT SCHWARZENBACH

PARTS OF A SEQUENTIAL SWITCH GEAR

development and logistics of components for products threatened by obsolescence or discontinuation, gains ever greater importance. Here too, Deuta has answers under the title "obsolesce management", which help to shape its internal processes and collaboration with customers.

ECONOMIC COMPETENCE

Shortage of funds in public budgets and among investors demands not only the requisite technical solutions but also extremely economical implementations. With a high level of technical proficiency and an eye for co-ordinating and putting into effect large-scale projects for vehicle modernisation or fitting out new series, Deuta finds formulae which take account, in a balanced proportion, the functional requirements and the upfront capital and operating costs, which govern life cycle costs in the long term.

DEVELOPMENT OF THE SCHWARZENBACH SITE TO A COMPETENCE CENTER FOR THE AUTOMOTIVE INDUSTRY

In this scenario, Deuta-Werke has evolved a growth plan which simultaneously offers several approaches to strengthening and expanding business. To win new markets, the branch establishment at Schwarzenbach almost doubled its machinery stock five years ago by adding turning and milling centres. Besides regular customers in different industries the automotive component supply industry has become a particular target. To this end the Schwarzenbach site has today a high standard of quality under the ISO/TSI 16949 standard and also a qualified and highly motivated workforce.

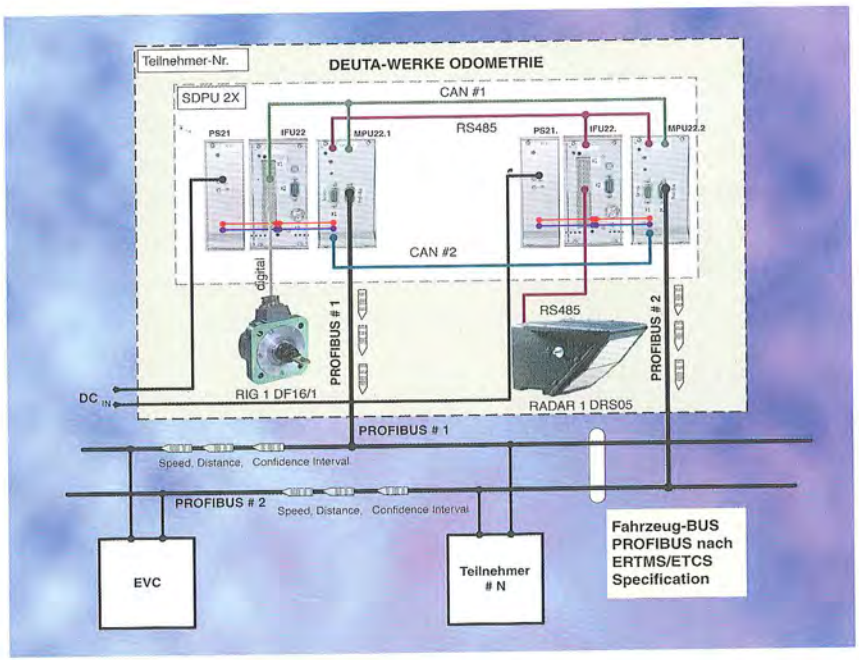
Acquisition of the assets of Gercom in 2003 was another event towards bolstering or recapturing industrial business. This had to take second place to railway business at the beginning of the 1990s, because of the high capital investment requirements and large contracts. The Gercom plant at Geretsried supplies industrial computers, terminals and special systems for general industrial automation.

PANEL-PC

THROUGH ASSET DEAL GERCOM BECOMES PART OF DEUTA-WERKE

SUPPLIER OF SYSTEMS OUT OF ONE HAND

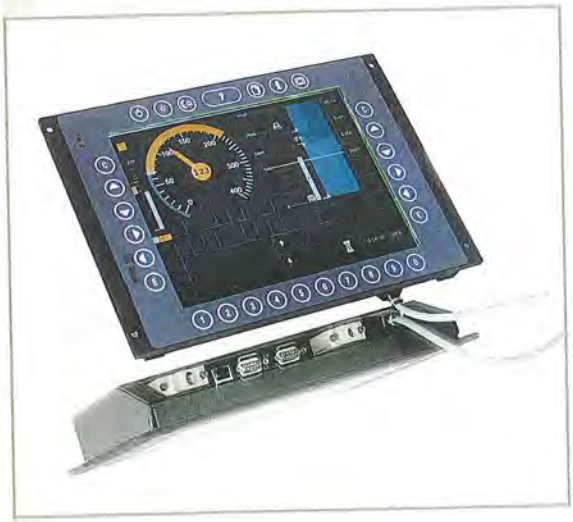
In the railway sector, the strategic approach now being followed is to complement the product range of components with integrated solutions. The most recent examples are the speed distance unit, the driver's desk as a rail vehicle's integrated driver's console and the radio-controlled railway operating system FgB. Vehicle builders are thereby given the means of obtaining complex and economical solutions from a single source and from an experienced supplier in the transportation engineering field.



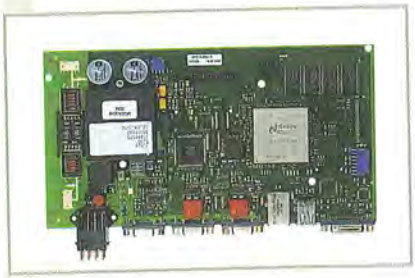
2002

CLOSING OF THE INTERNATIONAL RESEARCH PROJECT EUROPEAN DRIVERS DESK (EUDD)

DRIVERS DESK



MFT 1



GEODE-BOARD

STRATEGICALLY WELL-PLACED

The company's internal and external resources have been substantially augmented for this. The development division for example possesses both a modern development, design and testing environment and latest hardware and software. Worldwide cooperation with other companies in the field of procurement and production will make it possible to respond flexibly to the most varied technical economical and logistical demands in the future.

One essential feature of Deuta's current procurement strategy in the advanced microcomputer market with its short lifecycles is functional standardization. Short lifecycles considerably hamper co-ordinated collaboration between operators, vehicle builders and component suppliers. "Minor changes" in chipsets can have major effects on maintaining the performance specification of hardware and software. To obviate these risks, the company has taken decisions which set a pattern for the future.

Deuta has entered the field "design and production of embedded PCs". Here design of Pentium based CPU's and important peripherals for the microprocessor-controlled devices have since 2001, designed by our own staff. Functionality, standardisation, the latest technology, long-term availability, ease of maintenance and economic efficiency are the key principles here.

GLOBAL PRESENCE

A new prospect is opened up by the company's presence in China. In 1994, Deuta-Werke and the Shanghai-based Chinese company SRCEF established the joint venture "Shanghai Deuta Electronic & Electrical Equipment Co., Ltd.". The subsidiary produces and distributes rotation speed sensors, speed indicators and incident recorders adapted for the Chinese market. It is an approved and highly respected supplier of the Ministry of Railways and locomotive factory in China. Shanghai Deuta possesses skills and basic requirements for growth in additional product fields and services for the parent company. The enormous growth potential offered by the Chinese market must be exploited and its rapidly developing productive capacity utilised for all business tasks.

SHANGHAI DEUTA MANUFACTURING FACILITIES

GROUP MEETING AT SHANGHAI DEUTA

THE PULSE OF TIME

Today, Deuta is working in three business sectors. Transportation engineering has outstripped the industrial automation dominant for many decades and now makes up some 75 % of the business volume. Here, Deuta is distinguished by its broad spectrum of skills. This extends from comprehensive expertise in the various service environments and special features in vehicle operation to integration of components and interfaces in higher-level vehicle systems – all skills and knowledge which comply with international standards and approval procedures.

The special recognition which Deuta enjoys in this sector with its high reliability and safety requirements, is evident from the fact that the company's participation is sought in international study groups in which strategic questions relating to future and progress in rail-transport technology are discussed. Key significance is accorded to the topics so important to European Rail Traffic Management System (ERTMS) / European Train Control System (ETCS), in which Europe places much hope.

New challenges, complex circumstances and constant change have accompanied the company history of Deuta-Werke for a hundred years. In this time, the firm has always managed to find ways of helping to satisfy people's quest for mobility and putting them successfully into effect. The company thanks all its business associates and friends, the shareholders and its staff over the years who have made this possible. We are happy to pause for a moment to look back on this turbulent time.

It approaches the tasks for the future with impressive ideas and enterprising vigour. The people who will shape our future know the secret of success. It lies in mastering change – as it has done for 100 years.