MICRODIS

COMPETENCE & RELIABILITY

MICRODIS ELECTRONICS

Leading in Eastern Europe as

- **Technical broadline distributor of electronic components**

- **Logistic and service provider**

- **Always reliable business partner**

Logistic Centre, Poland

Pan East European sales network

Local & professional support

- Microdis companies located across Eastern Europe

- Over 30 years of experience and built up trust on the market

MICRODIS BUSINESS MODEL
Sales strategy

Technical distribution

Franchise distribution of selected manufacturers
Competent application & design-in support
Extensively trained Application Engineers

One stop shop

Comprehensive portfolio with millions of components
Reliable source for mass production,
as well as for few pieces prototyping and R&D

MICRODIS BUSINESS MODEL
Services

MICRODIS
COMPETENCE & RELIABILITY

Added value services

- Dedicated web for Epson programming service
- Harness making
- Online ordering and access to components base
- Logistic know-how

Reliability

- AEO and ISO 9001:2015 certificates
- Carefully selected business partners
- Over 30 years of cooperation with customers and suppliers

PORTFOLIO

PRODUCT GROUPS

OPTO & PASSIVE

HARNESS MAKING & TOOLS

CRYSTAL DEVICES

WIRELESS

E-MECH

EMBEDDED

GNSS RECEIVERS

Wireless
GNSS receivers

MICRODIS
COMPETENCE & RELIABILITY

## u-blox state of the art GNSS receivers

- Benchmark for GNSS performance
- u-blox expertise
  - Own chipsets, algorithms, modules
  - In-depth support
  - Developed for professional market
  - No dependency on external suppliers
    Product life cycle under u-blox control (EOL)

- Form factor policy
- Built-in security
- Zero defect strategy
- ISO 16750 qualified modules for in vehicle use, modules produced in Austria (ISO 9001)

- Assisted GNSS service

Standard Precision

High Precision

Dead Reckoning / IMU

Timing & Frequency
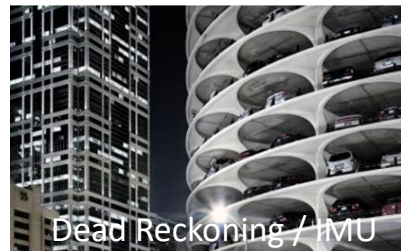
u-blox

GNSS receivers
Standard Precision

u-blox M8 / M9 / M10 / F10

- Up to 4 GNSS systems used in parallel
- High performance modules for small antennas
- Cost and size efficient portfolio

- High Accuracy: 1m / 1.5m*
- Low Power: 3mW (1Hz)
- Up to 25Hz update rate

- Examples of features:
  - Super-S precision enhancement
  - Spoofing & Jamming protection
  - Odometer, Arm Swing compensation
  - Protection level (95% confidence about the position)

- Same form factors across families and technologies:
  - Standard/High Precision, Dead Reckoning, Timing

* dual/single band w/ SBAS, CEP

ZOE
4.5x4.5x1 mm

MIA
4.5x4.5x1 mm

MAX
10.1x9.7x2.5 mm

NEO
12.2x16mmx2.4 mm

SAM
15.5x15.5x6.3 mm
Performance optimized
antenna module

CAM
9.6x14x1.95 mm
Miniature GNSS with
built-in antenna

ZED
17.0x22.0x2.4 mm

GNSS receivers
Dead Reckoning

MICRODIS
COMPETENCE & RELIABILITY

Modules with built-in sensors (IMU)

- Higher precision in urban scenarios with reflections
- Navigation without sky view (tunnel, parking)
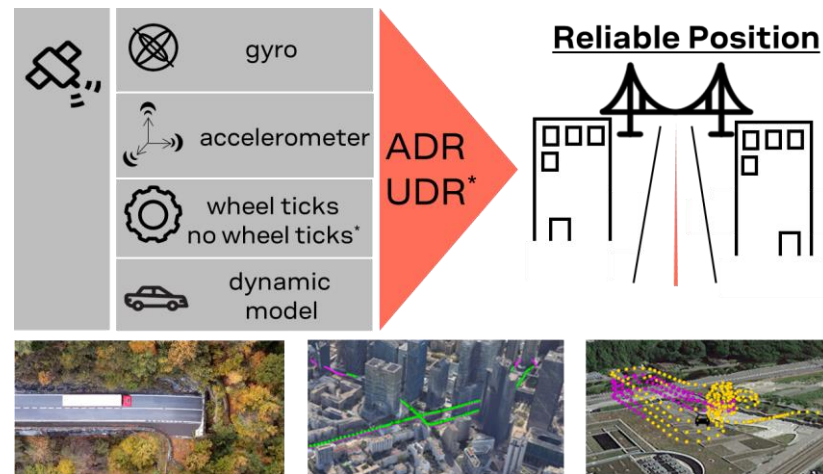- Up to 30Hz position update

UDR - Untethered Dead Reckoning
- plug&play, simple integration

ADR - Automotive Dead Reckoning
- wheel tick over HW pulses or CAN

ADR+RTK – Automotive DR with RTK corrections
- decimetre level accuracy (lane accurate positioning)

gyro

accelerometer

wheel ticks
no wheel ticks*

dynamic
model

ADR
UDR*

Reliable Position

u blox

WIRELESS

GNSS receivers
High Precision & Timing

High Precision with RTK corrections

- L1/L2, L1/L5 Single and Multi-band receivers
- Position accuracy up to 1cm
- Heading accuracy up to 0.3deg[*]
- Corrections: local, network, satellite

[*]baseline length 1.75m

Timing & Frequency receivers

- Time synchronization and measurement
- Nanosecond-level accuracy
- Meets 5G network requirements (2.5ns)
- CVTT (*Common View Time Transfer*) Differential timing
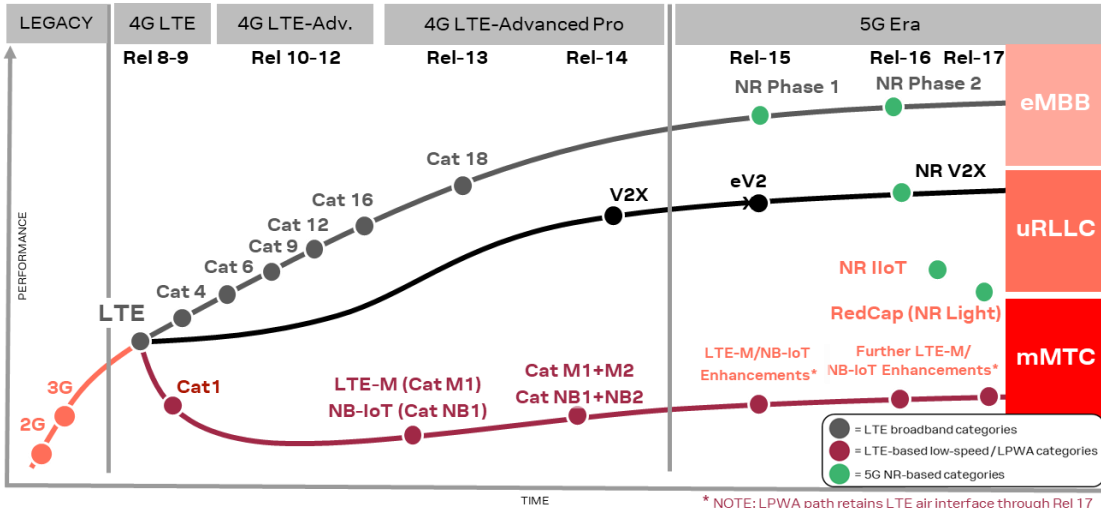
Telecom   Energy   Finance

u-blox

WIRELESS

**CELLULAR
AND SATELLITE IOT**

Cellular portfolio

Optimised for IoT market:

- **2G and 3G**

  Matured but low price, good coverage
  Used mostly in EU, CIS, South America
  Data and voice

- **LTE-M, NBIoT**

  New, power & cost optimised LTE standards
  Data (voice in the future), 2G fallback

- **LTE Cat.1, LTE Cat.1-bis**

  Excellent coverage in place, balanced cost
  Data and voice, 2G/3G fallback
  Low cost option: Cat.1-bis (one antenna)

- **LTE Cat.4+**

  Fast data rates

5G – category eMBB introduced
For high speed data streaming

13

Wireless
Cellular modules
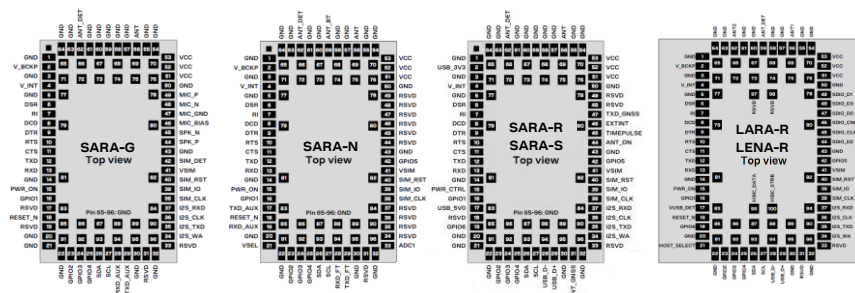
Designed for professional applications

- SARA/LARA/LENA form factor across technologies

- Power, size and cost optimised, reliable modules
  - No compromise in Tx power (23dBm), for coverage
  - ISO 16750 qualified, for in vehicle use
  - u-blox add-on features, for industrial use cases
  - Diagnostic interface and modes
  - Polished utilization of new technologies (network timers, eDRX, RRC Release, etc.), in-depth support
  - Global and local approvals incl. ATEX
  - Zero defect strategy, produced in Austria (ISO 9001)

- u-blox chipset to control the features, life cycle (EOL) and supply chain
- Outstanding security level, secure ecosystem
- Industry's broadest patent infringement protection, declared officially in T&C

2G — SARA-G Top view

LTE NBIoT — SARA-N Top view

LTE-M / NBIoT / 2G, Satellite IoT — SARA-R SARA-S Top view

LTE Cat.4 / Cat.1 Cat.1-bis/ 2G / 3G — LARA-R LENA-R Top view

SARA-R5   LARA-R6   LENA-R8

u-blox

Wireless
Cellular modules
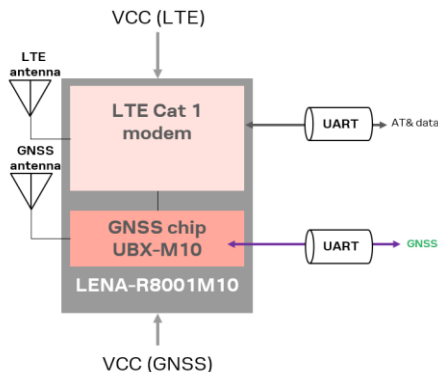
Dual modules: Cellular and GNSS

- Professional approach: separated u-blox chipsets
- Zero compromise
  - The best GNSS performance
  - Additional SAW/LNA for small GNSS antennas
  - Real parallel, independent LTE/GNSS operation
  - LTE at 23dBm Tx level, for coverage
  - Designed for ultra low power

Size optimised, rich in IoT features

- LEXI, 16x16mm form factor
- LTE-M / NBIoT+2G fallback
- Optimized power management to meet IoT requirements

Wireless
Cellular and Satellite IoT modules

IoT connectivity without coverage issues
LTE-M / NBIoT + Satellite IoT

Satellite communication backup ensures coverage
- Worldwide band coverage LTE-M / NBIoT
- Satellite connectivity using GEO ORBCOMM's IsatDataPro (IDP) satellite communications protocol
- Emedded u-bloxM10 GNSS positioning chipset
- Small and popular SARA form factor

MICRODIS
COMPETENCE & RELIABILITY

SHORT RANGE

u-blox

NINA-B416

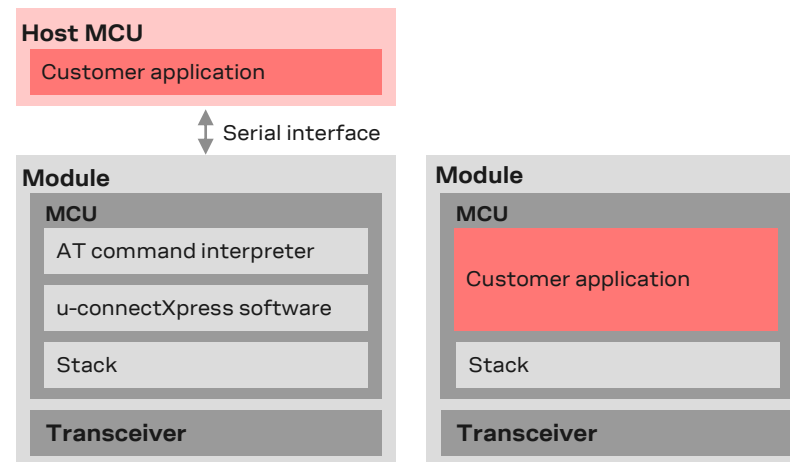# Short range modules
Stand-alone

Quick development, BT/Wi-Fi stacks built-in short range module

u-connectXpress option
- pre-flashed u-blox u-connectXpress software
  - common AT interface across different modules
  - stacks integrated by u-blox
  - additional features (GATT, SPS etc.)
- Fastest time to market, no software development and testing on customer side

Open CPU option (Wireless CPU)
- Application runs on the u-blox module, based on 3rd party SDK
- Stacks integrated by the customer
- Thread, Matter, Zigbee, Low Energy Mesh support

Host MCU

Customer application

↕ Serial interface

Module

MCU

AT command interpreter

u-connectXpress software

Stack

Transceiver

Module

MCU

Customer application

Stack

Transceiver

WIRELESS

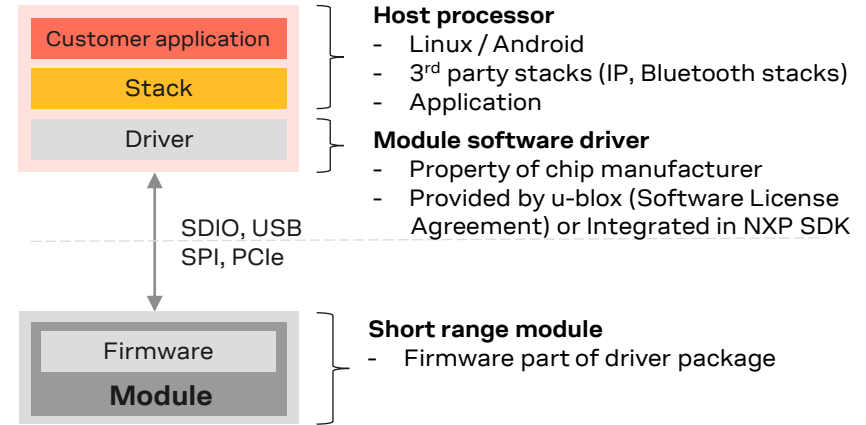# Short range modules
Host-based

For devices with host processor and open OS

Application runs on host processor
3rd party stack runs on host with open OS

Support (drivers) included in SDKs of some MCU suppliers

- MCUXpresso SDK from NXP simplifies integration of host-based modules with popular families of NXP processors (i.MX / iMX RT)
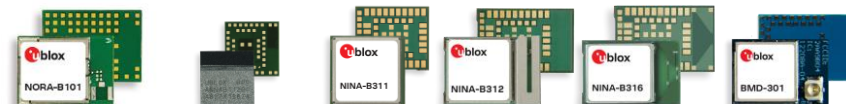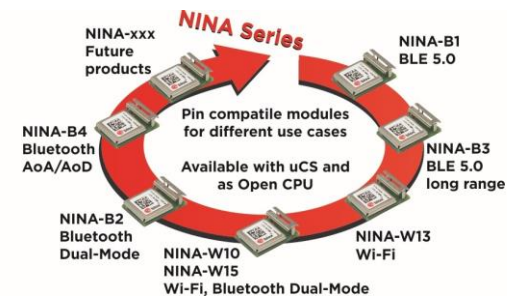

Customer application
Stack
Driver

Host processor
- Linux / Android
- 3rd party stacks (IP, Bluetooth stacks)
- Application

Module software driver
- Property of chip manufacturer
- Provided by u-blox (Software License Agreement) or Integrated in NXP SDK

SDIO, USB
SPI, PCIe

Firmware
Module

Short range module
- Firmware part of driver package

WIRELESS

Wireless
Short range modules

Certified, industrial Bluetooth modules

- BT 2.x, BLE 4x & 5.x, also with medical certificates
- Combo with Wi-Fi available
- u-blox u-connectXpress software for easy application design and fast time to market
- Open CPU option for customer application
- Dual core module, one MCU dedicated for application

- NINA form factor for easy multi-solution design
- Dedicated modules for small size (ANNA)
- High density footprints (NORA) for many I/Os
- Various antenna versions, simplified certificates

- AoA/AoD, Mesh, LE Audio, Long range available
- Thread, Matter, Zigbee support

u-blox

Certified, industrial Wi-Fi & Combo modules

- Up to Wi-Fi 6 with WPA3 and Bluetooth 5.x
- Wi-Fi, Bluetooth LE and Classic combo available
- u-blox u-connectXpress software for easy application design and fast time to market
- Open CPU option for customer application
- Various antenna versions, simplified certificates

- NINA form factor for easy multi-solution projects
- Host-based modules for more control and flexibility, with SDIO or USB host interfaces
- Versions dedicated for automotive available
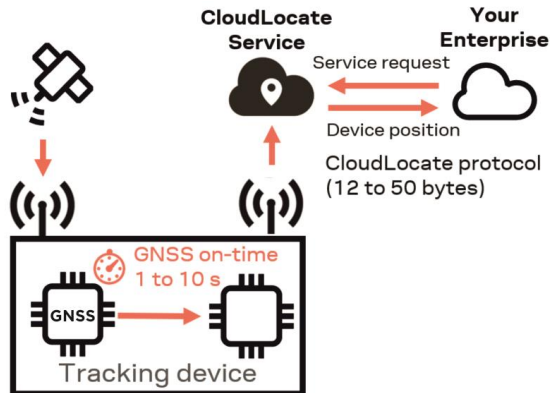
- M.2 WiFi/Bluetooth cards

u-blox
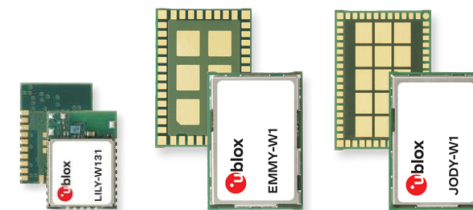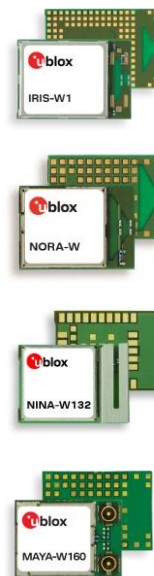
SERVICES

Wireless
Services
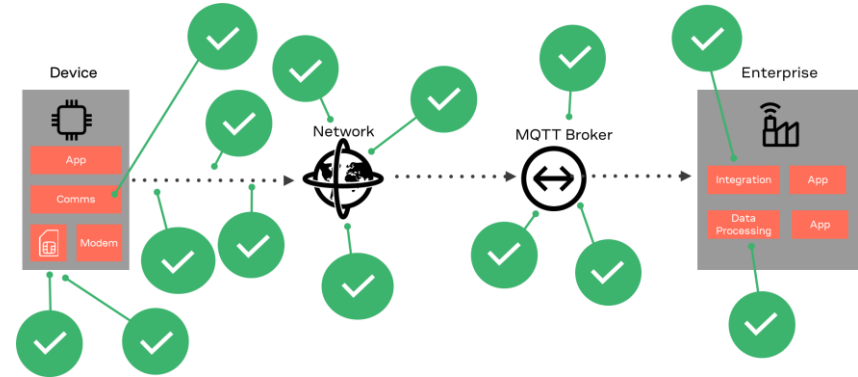
Location

- AssistNOW: data supporting GNSS receivers
- CellLocate: positioning based on cellular network
- PointPerfect: PPP-RTK correction service for high precision navigation
- CloudLocate: cloud based location saving 90% of power

CloudLocate Service

Your Enterprise

Service request

Device position

CloudLocate protocol (12 to 50 bytes)

GNSS on-time 1 to 10 s

GNSS

Tracking device

IoT Communication

- Complete connectivity solution for IoT applications
  - SIM, roaming, data transport solution (SDK/libraries)
  - Simple, visual Data Flow Manager
  - u-blox MQTT-SN over USSD or UDP built-in SDK
  - Optimised for low power and low bandwidth
- No hidden costs, pay per MQTT messages
- Seamless integration into Azure, AWS etc.
- Applicable for 2G, 3G, LTE and Wi-Fi devices

Devices

Enterprise

Bearer
Roaming
Cost

Device Software | Protocol | Network | Data Organisation and Control | Data Formatting | Enterprise Integration

u-blox

WIRELESS

Wireless
Antennas

Wide selection of products for all wireless applications

- GNSS antennas
  - L1 and multiband (L1, L2, L5)
  - Active and passive
  - External and internal
  - Patented helical antennas from Maxtena
- Cellular antennas, from 2G to 5G (New Radio)
- ISM antennas, for all popular bands
- Various mounting options: patch, magnetic, screw, wall mount, connector mount
- Customisation options

Wireless
Accessories

RF Connectors

- All standard connectors: SMA, FME, MCX, MMCX…
- SMD, THT and Edge mount
- Customisable materials and dimensions

SIM Holders

RF Pigtails

- Available with all standard connectors, also in bulkhead versions
- Various coax cable options
- Customisable length, stripping, tinning

RFID

Wireless
RFID

Typical RFID transponders

13.56MHz and 125kHz, several chip options
- ISO cards, white or personalized
- Key fobs
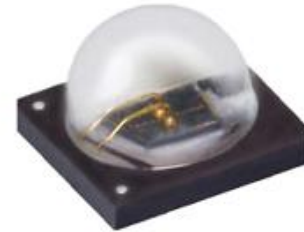- Wrist bands

Application specific, reliable solutions

Transponders, readers, antennas
- Animal Identification
- Keg & Container
- Service & Inventory
- Industry & Logistic
- Access & Security
- Individual Solutions
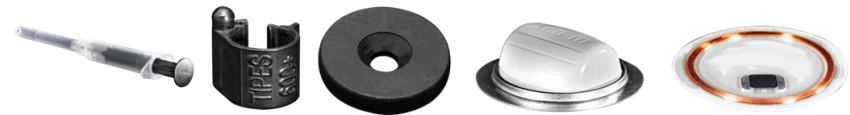
**AEG ID**

**OPTOELECTRONICS,
PASSIVE COMPONENTS**

OPTO & PASSIVE

Opto & Passive
LED Diodes

Wide selection of LED diodes for various applications

- 3C Electronics - THT LEDs in various shapes, colours and sizes
- Horticulture dedicated mid and high power LEDs for plant growth stimulation with specific wavelengths
- UV & IR LEDs for special applications. Low, mid and high powers, in various form factors. Wide selection of UV wavelengths (270nm-420nm)
- Lighting Products mid and high power white LEDs in most popular packages (2016, 2835, 3030, 5630, 3535), available also in R, G, B colours
- COBs in standard sizes
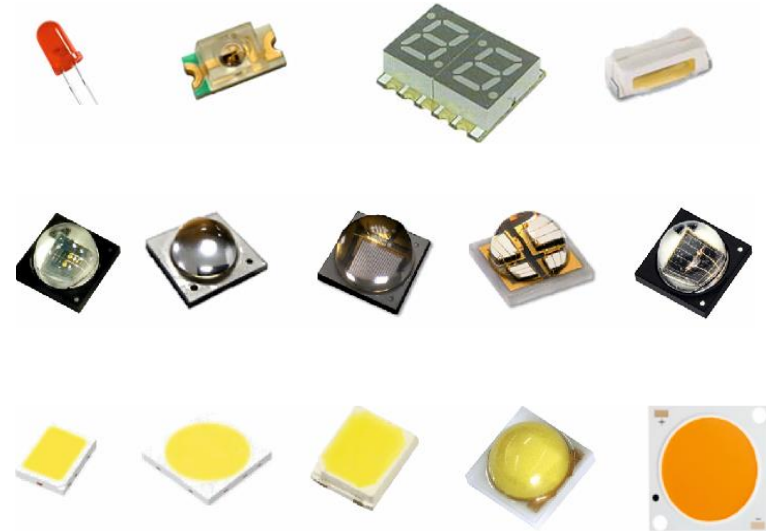
Opto & Passive
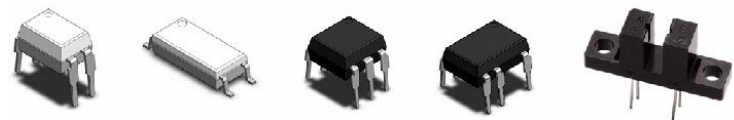## Displays and Photo-components

LCD, OLED and TFT displays

- Wide selection of sizes and number of characters
- Monocolour and full colour OLED and TFT displays
- LCD with touch available

Optocouplers, photodiodes/transistors/ interrupters

- Over-under and coplanar types (for better CMR performance)
- DIP and SOP packages

Opto & Passive
Passive Components

Magnetic components

- Circuit protection, ESD, MOV, GDT
- Inductors: chip, bead, power in THT and SMD Transformers
- Charging coils

• High quality polymer capacitors

- ✓ Provide longer lifetime, voltage stability in different temperatures
- ✓ Low voltage derating
- ✓ Very low bias dependency
- ✓ Capacitors for demanding applications

CRYSTAL DEVICES

**CRYSTAL UNITS
OSCILLATORS
RTC MODULES**

Crystal devices

Crystal oscillators
- TCXO
- SPXO (kHz & MHz)
- Programmable Oscillators
- VCXO
- SAW Oscillators

Real time clocks

Crystal units
- kHz
- MHz
- SAW Resonators & Filters

X-tal based sensors
- Gyro
- Pressure
- Intertial Measurement Units (IMU)

EPSON®

Crystal devices
Programmable Oscillators

Create your custom SPXO configuration in three easy steps:

- Select a series of products
- Select the package size
- Define electrical parameters

Interactive on-line configurator available now!

Enjoy 24h shipment!

epson.microdis.net

Crystal devices
High End Crystal Devices

Defence and instrumentation solutions

- MIL-PRF-3098 Crystal Resonators
- Low noise and low jitter SPXO
- High performance TCXO
- Low noise and low g-sensitivity OCXO
- Ultra low phase noise OCSO & Multipliers

Sub-systems and frequency synthesizers

Hi-reliability products for space

- ESA/SCC 3501, MIL-PRF-3098 qualified Crystal Units
- SPXO, TCXO, VCXO, OCXO oscillators in Hi-Rel Space and New Space spec.
- GPS disciplined oscillators
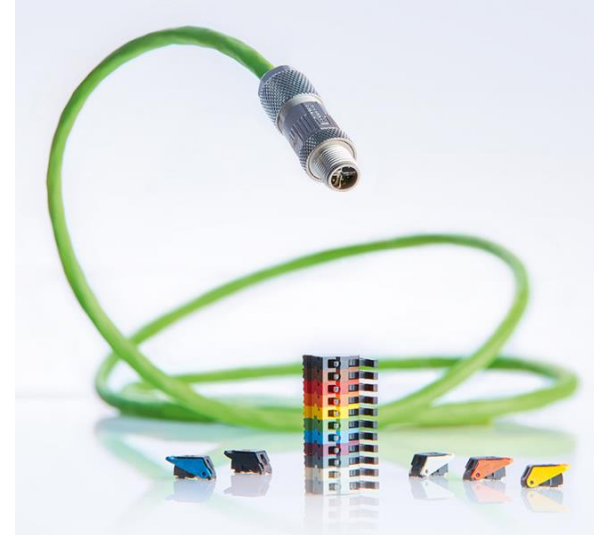
Ground station solutions

Image: Courtesy of ESA

USO   OCXO   XO

rakon

CRYSTAL DEVICES

ELECTROMECHANICAL

Electromechanical Components
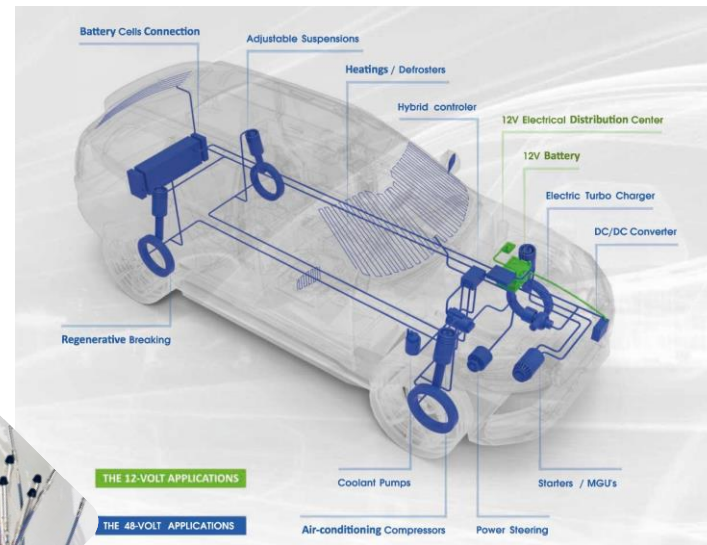## Cabling Solutions for Automotive & Home Appliances

Offering innovation in product and manufacturing technologies

Lear's product portfolio includes standard and custom terminal & connector systems, with capability ranging from signal to high power

Lear main portfolio

- Leaf spring connection systems
- Pin and socket round connection systems
- Secure contact systems
- Flat fuse connection systems

Battery Cells Connection
Adjustable Suspensions
Heatings / Defrosters
Hybrid controler
12V Electrical Distribution Center
12V Battery
Electric Turbo Charger
DC/DC Converter
Regenerative Breaking
THE 12-VOLT APPLICATIONS
THE 48-VOLT APPLICATIONS
Coolant Pumps
Air-conditioning Compressors
Power Steering
Starters / MGU's

LEAR CORPORATION

E – MECH

Electromechanical Components
Cabling Solutions for Automotive & Home Appliances

MICRODIS
COMPETENCE & RELIABILITY

Solderless terminals

- Wire to PCB connectors
- PCB to PCB connectors
- Wire to wire connectors
- Solderless terminals and splices
- Flat ribbon cables
- Control cables
- Stranded wires

- Chain terminals 2.8-4.8-6.3-7.7-9.3mm
- Tabs & Receptacles
- Ring tongue and other solderless terminals and splices
- Customer specific products

JST
The Quality Connection

SAVOY TECHNOLOGY

Electromechanical Components
Cabling Solutions for Industry, Defence & Medicine

MICRODIS
COMPETENCE & RELIABILITY

Turning your connectivity challenges into success stories:

- Miniaturization & weight reduction
- Data transmission: more and & faster
- Extreme sealing & hermeticity
- Complete solutions (connectors & cable assemblies)

Choose from more than 30,000 connector configurations

Fischer CONNECTORS

Electromechanical Components
Cabling Solutions for Industry, Defence & Medicine

MICRODIS
COMPETENCE & RELIABILITY

FISCHER **CORE** SERIES	FISCHER **ULTIMATE™** SERIES	FISCHER **FIBEROPTIC** SERIES	FISCHER **MINIMAX™** SERIES	FISCHER **FREEDOM™** SERIES
ANY SIZE ANY CONFIGURATION ANY APPLICATION	RUGGED COMPACT LIGHTWEIGHT	ROBUST OPTICAL PERFORMANCE EASY CLEANING	HIGH-DENSITY MINIATURIZATION HIGH-SPEED DATA TRANSFER RELIABILITY	EASY MATING EASY CLEANING EASY INTEGRATION

Fischer CONNECTORS

Electromechanical Components

Cabling Solutions for Industry, Defence & Medicine

MICRODIS
COMPETENCE & RELIABILITY

Complete solutions, engineering support, rapid delivery

- Vertically integrated solutions (connectors, components, cables and assembly)
- Expertise in design, manufacture & test assemblies
- Fast prototyping & production
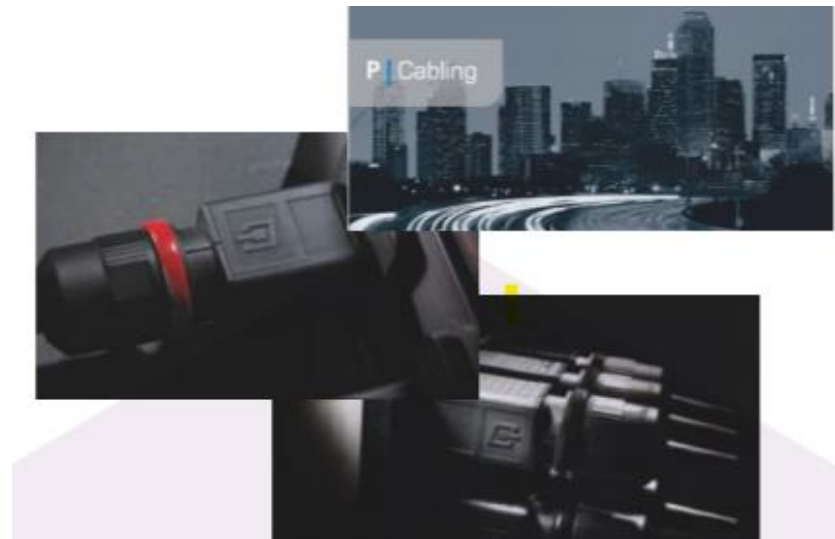- High quality guaranteed in low & high volume projects

Fischer
CONNECTORS
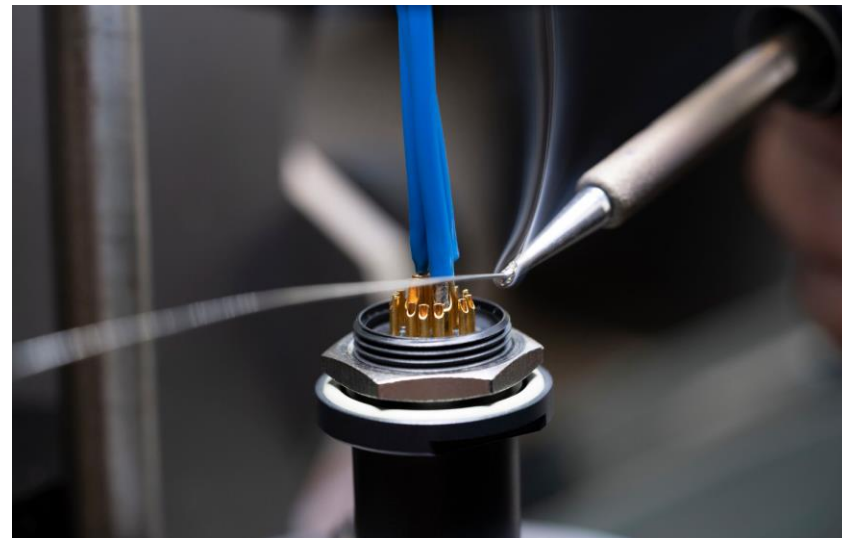
Electromechanical Components
Cabling Solutions for Networks

Building and industrial cabling, data communication

- Office fibre optic
- Office RJ45
- Industry fibre optic
- Industry RJ45
- Ethernet M12
- Industry unequipped housings
- Data centre solutions
- Assembled cables
- Accessories

Electromechanical Components
Industrial Cables

Interconnecting wires

- Insulation: PVC, PE, TPE, Silicone, PP, PA, TPE, PUR, Glass filament, EVA, HFFR, mPPE etc.
- Temperature range: -200 to 1200°C
- Wide cross section range
- Halogen-free/flame resistant/lead free
- VDE, UL/CSA, MIL, ADR approvals
- DIN, HAR, multinorm standards
- Single, multiple, fine, flat wire
- Single, double, triple coloured
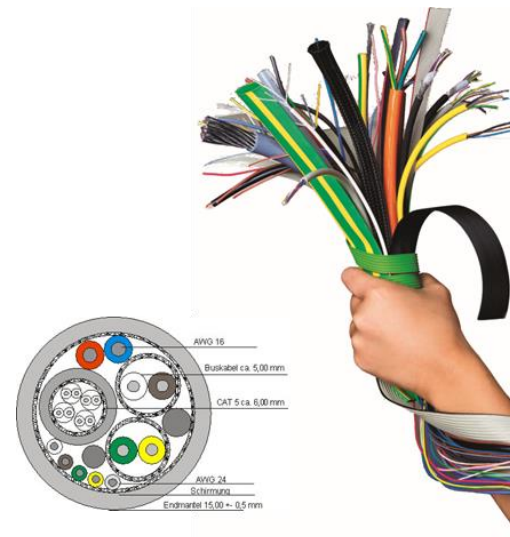- Customised hybrid cables from 1km

Electromechanical Components
Industrial Cables

MICRODIS
COMPETENCE & RELIABILITY
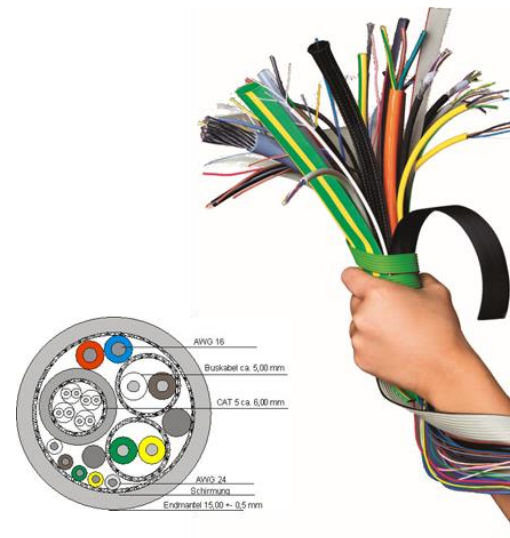
Application in industry segments

- Engineering and automation
- White goods production
- Medical equipment
- Heating system
- Automotive
- Agriculture
- Lighting
- AV

and others

Electromechanical Components
PCB Level Connectors

- Board to Board & Cable to Board Connectors
- DC Power Jacks
- FFC Cables & Connectors
- Lighting Connectors
- Memory Card Connectors
- Modular Jacks
- Sim Card Connectors
- USB Connectors
- D-sub Connectors
- DIL, PGA, PLCC, transistor sockets
- IDC connectors & Flat ribbon cables

JST
The Quality Connection

fischer elektronik
to cool to protect to connect

METZ
CONNECT
We realize ideas

GCT

E – MECH

45

Electromechanical Components
Plastic Enclosures

Performance engineered enclosures

- Universal & heavy duty enclosures
- Hand held cases
- Din-Rail boxes
- Desktop and instrument cases
- 19" enclosures & subracks

Customization capabilities

- Machining: milling, drilling, cutting and countersinking etc.
- Surface coating and RFI shielding
- Printing and engraving

CAMDENBOSS
CONNECT. ENCLOSE. INNOVATE.

E – MECH

Electromechanical Components
Plastic Enclosures

MICRODIS
COMPETENCE & RELIABILITY

Custom designed enclosures
- Tool FREE proces
- Rapid Lead Times
- No MOQs
- Industrial designers & CAD/CAM engineers at your disposal
- Make changes to the design quickly & easily after prototyping or after production
- Wide range of materials
- System integration

SMARTBOXX
DESIGN. ENCLOSE. MANUFACTURE.

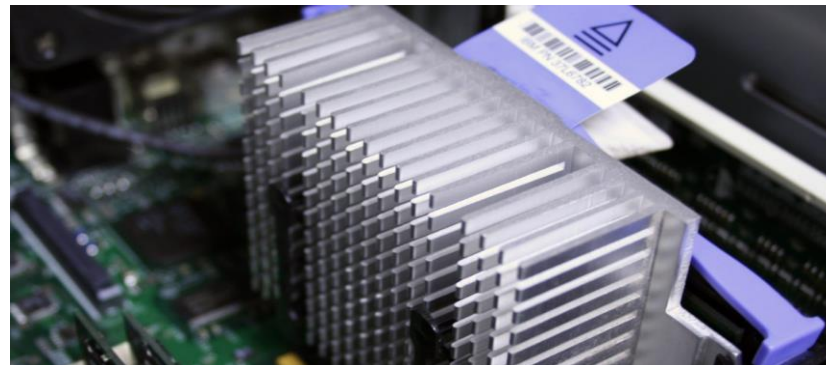# Electromechanical Components
Aluminum Heatsinks

Thermal management

- Machined extruded heatsinks
- Heatsinks and fan coolers for processors
- Lamella heatsinks
- Cooling aggregates
- Thermal interface materials

Services

- Precision Machining
- Decorative versions

fischer elektronik
to cool to protect to connect

E – MECH

Electromechanical Components
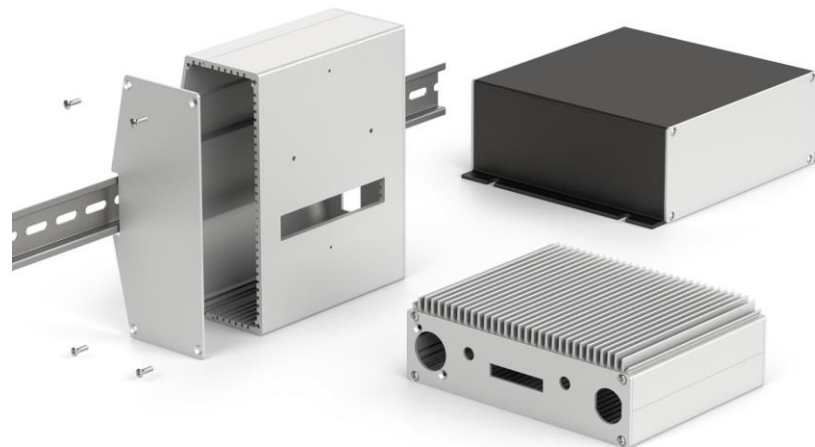## Aluminum Cases

MICRODIS
COMPETENCE & RELIABILITY

Cases
- Miniature aluminium cases
- Design cases
- Combination cases
- Tube cases
- Desk consoles and shell cases
- 19" System cases, subracks, Plug-in boxes

Services
- Precision Machining
- Screen printing & Laser lettering
- Powder Coating

fischer elektronik
to cool to protect to connect

Electromechanical Components
Terminal Blocks

MICRODIS
COMPETENCE & RELIABILITY

Spring clamp terminal blocks

- Solderable & Pluggable
- Compression-mount
- For solid wires and multi-stranded wires
- Nominal cross section of 0.08 - 2.5mm
- Centerline 2.5 - 10mm

Screw-type terminal blocks

- Solderable & Pluggable
- Single poles
- For solid wires and multi-stranded wires
- Centerline 3.5 - 10.16mm

IDC type terminal blocks

- Solderable
- Centerline 3.5 - 10.16mm

METZ CONNECT
We realize ideas

CAMDENBOSS
CONNECT. ENCLOSE. INNOVATE.

MICRODIS
COMPETENCE & RELIABILITY

EMBEDDED

Embedded
Industrial Computers

Optimised for industry

- Operating time 24h/7days
- Cost-effective & high reliability
- Wide operating temperature
- Anti-vibration & shock
- Dust resistant
- Up to 15Y product availability
- Strong metal housing & compact size
- High quality components
- Wide input voltage range
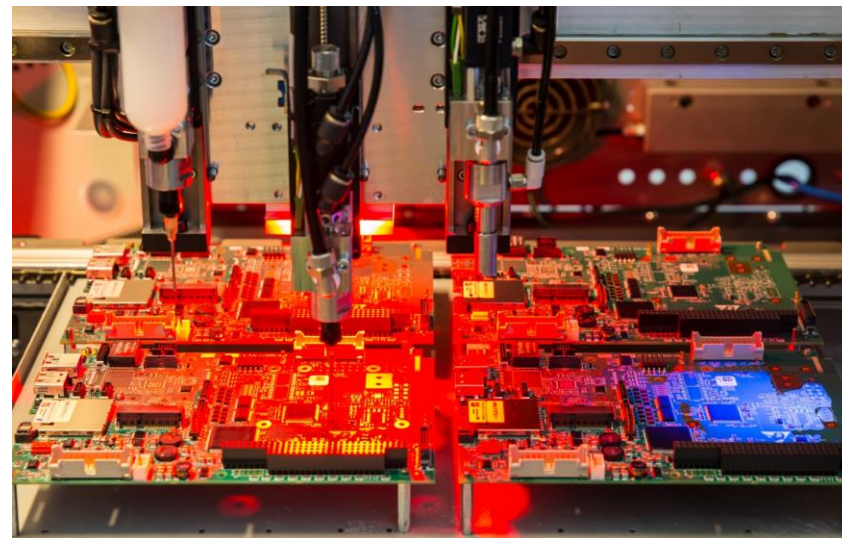- Custom I/O interfaces
- Low power consumption

Embedded
Motherboards

Motherboards

- SBC 3.5" , 4x4"
- Mini-ITX, Micro-ITX, ATX
- Mini-STX, Micro-STX
- Computer on Module
- Embedded Peripherals

Embedded
Industrial Computers

Dedicated Box PC

- Automation industry
- Digital Signage
- Machine Vision
- Robotics
- In-vehicle
- Railway

NEXCOM   NEOUSYS TECHNOLOGY

EMBEDDED

Embedded
Industrial Panel Computers

MICRΦDIS
COMPETENCE & RELIABILITY

Panel PC

- All-In One with IPC integrated
- Sizes from 7" to 21.5"
- Multi-functional and powerful
- Durable & professional design
- Resistive / Capacitive Touch
- IP65 front bezel
- Waterproof IP67 chassis
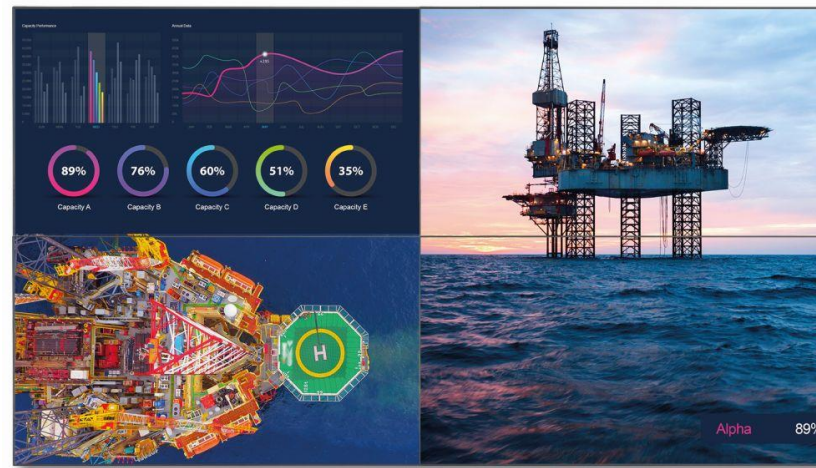- LED display
- VESA / Panel Mount

Embedded
Displays and projectors

Wide range of high quality monitors

- Desktop / Large format
- Protective glass
- Open-frame
- Interactive (with Touchscreen)
- Standard brightness and sun readable
- Video-wall
- Collaborative Solutions
- Projectors

SHARP / NEC   iiyama   LITEMAX
Sunlight Readable LCD!

EMBEDDED

TOOLS & HARNESSES

Professional hand tools

- For crimping of single terminals and cable ends
- With changeable heads or dies…
- … also used for WDT machines

- For automatic crimping of end ferrules 0.08-10.0mm^2
- For automatic stripping 0.03-16.0mm^2
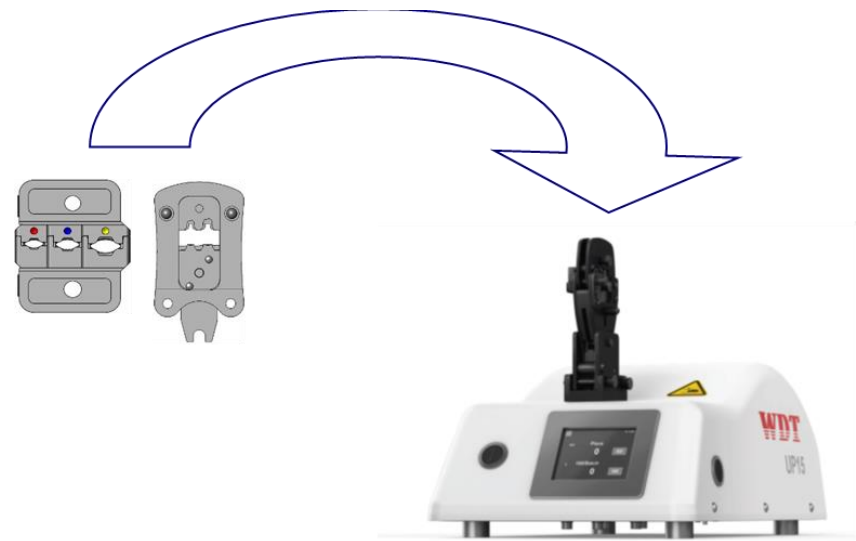- For cutting of cables up to 400mm^2

WEZAG®
WERKZEUGE | TOOLS | OUTILS

Professional electric machine UP15

- Compact design and low weight
- For crimping of single terminals and cable ends
- With changeable heads or dies, used also with hand tools (CSV10, CS30 system)
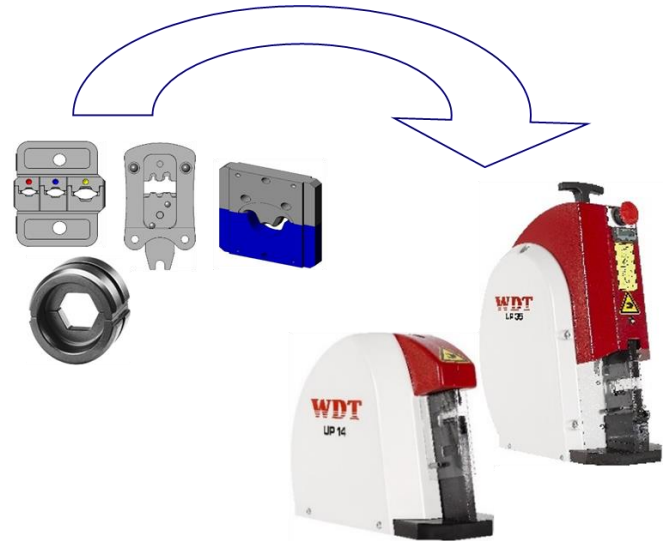

WDT®
WIRE PROCESSING SYSTEMS

Harness Making, Assembling & Tools
Pneumatic & Hydraulic Presses

Professional presses

- With linear crimping (except UP14)
- For crimping of single terminals and cable ends up to 400 mm^2 (150 kN)
- With changeable heads or dies, used also with hand tools (CSV10, CS30 system)

Harness Making, Assembling & Tools
Electric Presses & Applicators

MICRODIS
COMPETENCE & RELIABILITY

Professional solution for semi automatic crimping

- For crimping of all possible reeled terminals
- Applicators used for all standard presses as well as full automatic machines (Komax, Schleuniger, etc.)
- Based on electric presses only, with crimping force 1.5 - 20 Ton
- Additional built-on equipment like CFA or stripper – crimper

Mecal

ricardo&barbosa
mechanical mold and tool maker

61

Harness Making, Assembling & Tools
In-House harness production

Customized harnesses production

- Small and mid-sized projects
- Based on all typical connectors in the full and half – automatic process
- CFA control
- Pull force measurement
- Tinning of wires (autom./manual)
- Soldering of wires to PCBs
- Assembling

HARNESS MAKING & TOOLS

THANK YOU FOR ATTENTION

WWW.MICRODIS.NET

We will be happy to support you

COMPETENCE & RELIABILITY

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