Digital & Virtual / Augmented Reality

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Virtual simulators	**B1**
Creation of contents in Virtual Reality	**B4**
Augmented Reality & Remote support	**B5**
Digital Simulators & Twins	**B5**

Virtual simulators

Simspray – Spray painting or blasting simulator

Simspray is an advanced simulator for spray painting, immersing the user in a painting cabin or on a conveyor.

- Technical fields: **Spray painting, powder painting, sand-blasting**
- Professional environments: **Industry, Bodywork, Aeronautics, Wood**
- **Learning the technical gesture** (Angles, Speed, Trajectory, Distance…) and settings with real-time visual assistance and tools evaluation

- **Easy to move for a multi-site use**
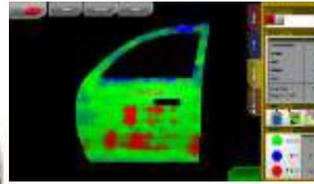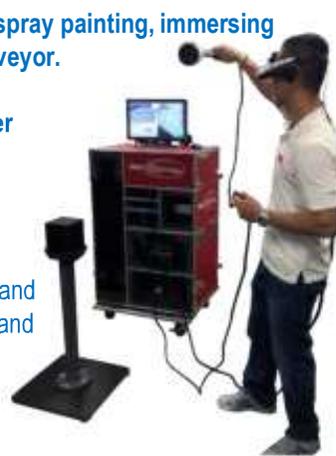
Result: painting cover

Result: trajectories view

View in immersion

www.erm.li/spr

Wave NG – Welding simulator

WAVE NG is a virtual tool for welding designed for training and evaluating the professional gesture of a welder.

- Three processes: **MAG** (Metal Active Gas), **MMA** (Manual Metal Arc), **TIG** (Tungsten Inert Gas)
- Teaching complying with the EN287 standard
- **Gesture learning** (Distance, Angle, Speed, Trajectory…) with real-time visual assistance and evaluation tools

- Real MAG, MMA and TIG welding torches (LITE and WORKBENCH version)
- **Easy to move for a multi-site use**

EDU Version

PRO Version

WORKBENCH Version

www.erm.li/wav

WOOD-ED Table – Virtual training simulator for wood-cutting machines

WOOD-ED Table simulates 4 different types of machines (band saw, dimensioning saw, planer and router).

- **Training on safety with the hands & head motion capture**: left/right hand positioning and compliance of the safety zone, cutting regularity and speed
- **Parameter settings**:
  - E.g., Planer: protection height and depth, depth of cut, deformation/hollow orientation, vacuum, motor
  - E.g., Router: type of tool, dimensions (height, depth), light height and width, hold-down shoe, guard, vacuum, motor

- Exclusive **force feedback** replicating the real cutting sensations
- The solution for practical training for young students in complete safety

www.erm.li/wot
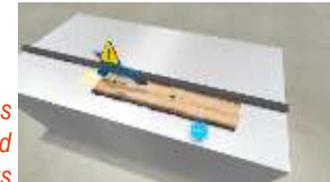
Exercise replay to focus on mistakes and possible improvements

WOOD-ED Factory – Virtual work station for sawmill operators

WOOD-ED Factory simulates the sawmill environment.

- Learning of the **driving procedures** of sawmill equipment
- Available with **2 or 4 tailstocks**

- Optimized training time without slowing down the factory activity and safe for the equipment

www.erm.li/wof

Headrig

Canter module

In partnership with **Mimbus**

Appealing for students and trainees
Optimized training time

Low cost consumables
Design and follow-up of learning path

Vortex – Earthmoving and lifting simulators of construction machines

Ultra-realistic driving simulator with progressive teaching based on real-life missions.

<u>Backhoe loader example</u>: understand the controls and positioning of the vehicle, positioning of the bucket, earthmoving and transport, excavation, loading of trucks, use of the quick =-coupling unit, safe handling of the load

1x hardware platform

5x earthmoving simulators (Backhoe, Excavator, Dozer, Wheel loader, Motor grader)

5x lifting simulators (Luffing tower crane, Tower crane, Mobile crane, Forklift, Crawler crane)seven machines:

- Several available hardware platforms: Desktop simulator, Entry-level motion simulator, Complete immersive simulator
- **Movement possible for multi-site use**
- **Other simulators in different fields available**
  (offshore energy, ports, etc.)

www.erm.li/vor

Train anywhere, anytime | Safer and cost-effective | Easy to transport for a multi-site use | Design and monitoring of training activities with LMS Vulcan

FL Trainer - Forklift driving simulator

Simulator covering 90% of the training learning objectives of the French R389 CACES training session:
- Mastery of **controls**
- Mastery of **movement to the front, rear and in narrow aisles**
- Mastery of **loading/unloading, stacking on the ground, pallet rack or truck**
- Learning of **sloping soils** and **risks of overturning**
- Mastery of the truck in the presence of people

www.erm.li/flt
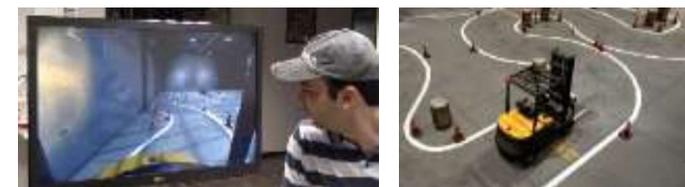
- **Interactive replay with the possibility of viewing from any point of view**

Virtual Building - "Scaffolding / Works-at-height"

NEW

Learning the procedures related to the use of fixed stationary and multi-directional scaffolding

- **Module 1: Control & Reception of stationary scaffolding**
  - Control of scaffolding compliance with respect to the plan and assembly instructions (mounting, compliance, implementation, blocking, level, field of use, assembly control)

- **Module 2: Use of mobile scaffolding**
  - 5 intervention missions: structural work, finishing, carpentry, joinery, study of constructions
  - Carrying out missions in compliance with safety rules

www.erm.li/vbt

In partnership with

Mimbus

Recommended immersion headsets: HTC Vive or HP Reverb
Design of 3D scenes in close connection with standards and experts in business/technology training

Virtual Building - "Risks and construction site organisation"

NEW

Training on procedures related to safety and site organization

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- **Module 1: Safety of a newcomer on site**
  - Sequence 1: Site visit and overall risk analysis with a map of areas to be assessed
  - Sequence 2: In order to do a job, recognize and analyze dangerous situations, then protect oneself to do the job in optimal conditions

- **Module 2: Safety management by a team leader or work supervisor**
  - Recommend solutions to avoid risks
  - Recommend solutions to reduce risks (collective or individual protective equipment)

Virtual Indus "Production control"

Training on procedures related to **the control of automated industrial production systems**

- Module 1: **SPC1 Statistical Production Control**
  - Sequence 1a - sampling procedure, graphic representation and interpretation of results
  - Sequence 1b - statistical control via control card and validation of production
  - Sequence 1c - statistical control, identification of drifts and/or malfunctions and reactions

- Module 2: **SPC2 Statistical Production Control**
  - Sequence 2a – doser qualification
  - Sequence 2b – control via control card

www.erm.li/vip

In partnership with

Virtual Indus "Electrical accreditation"

Training on procedures related to the **safety of electrical interventions**

- **B1V electrical accreditation**: perform an electrical operation in a LV reinforced adjacent area (area 4) with the installation and removal of an insulating blanket
- **BS electrical accreditation (2 sequences, BAT & INDUS)**: perform an elementary low voltage intervention on a switched off component and outside area 4
- **BR electrical accreditation**: replace a defective component after lock-out and recommission the installation with an adjustment task
- **B2/BC electrical accreditation**: perform the lock-out in one step, manage the work assigned to workers, have electrical operations carried out with the power off in a simple adjacent area (area 1) and tag-out at the end of the works.

www.erm.li/vie

- Recommended immersion headsets: HTC Vive or HP Reverb
- Design of 3D scenes in close connection with the standards and teams of experts in business/technology training
- Easy to move for multi-site use

- 3 training levels (beginner, advanced and expert)
- Possibility to review the scene to understand and learn one's behavior
- The "right to make mistakes" is possible without risks for the learner and the equipment

Virtual Indus "Maintenance & Diagnosis"

Training on procedures related to industrial maintenance and failure diagnosis

www.erm.li/vim

Electrical diagnosis & maintenance module:
- **3 types of random failures** on the Polyprod (filling and capping unit)
- Performance of an activity:
  - Finding the system failure
  - Troubleshooting looking in the technical file (electrical diagrams, etc.)
  - Change of faulty component
  - System restart and test

Virtual Indus "Refrigeration"

NEW

Training on procedures related to the **handling of refrigerants**

- Module 1: Skill certificate for handling refrigerants
  - Sequence 1: Refrigerant recovery
  - Sequence 2: Nitrogen pressurization and vacuuming
  - Sequence 3: Refrigerant charging and tightness control

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- Module 2: **R290 compressor replacement**
  - Sequence 1: Securing the place (supermarket) and intervention context
  - Sequence 2: Gas evacuation
  - Sequence 3: Removing the compressor
  - Sequence 4: Soldering or crimping the compressor
  - Sequence 5: Nitrogen pressurization and vacuuming

Virtual Indus
Frigorifique

"HSE" Immersive Factory

Training on HSE (Health, Safety, Environment) procedures and risks in public, tertiary and industrial environments

- Module "**Working Permit**"
- Modules "**Risk hunting**": house, office, warehouse, glazing manufacturing site, glazing store, factory, public works site, concrete plant, forklift truck
- Module "**Major risks: 10 golden rules**"
- Module "**Eco-gestures**"
- Module "**HSE Awareness**"
- Module "**Pallet handling**"
- Module "**Valve lock-out**"
- Modules "**Work at height**": viaduct, public road, factory, scaffolding
- Module "**Power lock-out/tag-out**"
- Module "**H0, B0, M0 accreditation**"
- Modules "**Traffic & Co-activity**": on site, on industrial site
- Modules "**Driving behavior**": light vehicle, forklift, dumpster, train

www.erm.li/ifh

Recommended immersion headsets: HTC Vive or HP Reverb

VirtuaFire

NEW

Professional virtual reality fire training tool with a physical fire extinguisher connected to the VR application

- Less expensive than conventional training
- More immersive and customized
- Zero carbon footprint (no flame generated)
- Safe (no risk of burning, falling or inhaling fumes)
- Emotional measurement strap to record fear, surprise and self-control

www.erm.li/vrf

Virtual Reality content creation software

Sphere - VR content graphic creation

NEW

Sphere makes Virtual Reality accessible to all, its handling is simple, intuitive and requires no programming skills

STEP 1: Import your resources at 360°
- The environment in which the user will operate
- Import photos/videos or 3D scenes (SolidWorks, etc.) at 360°

STEP 2: Bring your content to life
- Enrich the VR project with photos, videos, sounds, 3D objects, etc.
- Define the navigation and display conditions using the software's embedded implication editor

STEP 3: Test-publish
- Position your objects in the visual editor
- Test your WebVR resource in your VR headset or on screen
- Publish and broadcast via a web browser

- **Internal production of training content, virtual tours, etc.**
- **Generation of SCORM files**

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SPHERE

4DMU Edu - 3D project review solution for Industry and Building (BIM)

Reviews of collaborative projects in a 3D environment starting from 3D models originating from different industrial (Solidworks, Cata, Inventor) and building (Revit, etc.) design softwares

- **Exploration of the model on screens or in immersive headsets**
- Collaborative sessions with several participants in the same 3D scene with different points of view
- Scene management with:
  - **Creation of detail levels**
  - **Association of models, images, videos, etc. by hypertext links**
  - **Adding content to the 3D model**
- "Realistic rendering" option with specific lighting, rendering of materials, etc.

Navigating a 3D scene with HTC Vive

4Dmu

Importing BIM models

www.erm.li/4dmu

Diota ExcellAte - Augmented reality for Industry 4.0

Diota gives in real time to operators the geometric (3D models) and procedural (instruction sheets, etc.) data from industrial systems, in order to improve complex human operations: Assembly, Operation & Maintenance, Quality Control & Compliance.

- Augmented reality on **tablet, projective system and Hololens**
- Technology without marker for overlaying **virtual elements** (3D Models, Tools, etc.) **on the reality**
- Field data collection (photos, reports, etc.)
- Possible interface with MES, Supervision software, etc.
- **Integration with SolidWorks/Catia Composer** to graphically create augmented reality scenarios from the 3D model of the system

ExcellATE DIOTA Tablet with industrial camera support

www.erm.li/dio

ExcellATE DIOTA Projective

ExcellATE DIOTA Hololens glasses

Training approach:
- **Operator/technician level:** interventions and achievements guided by augmented reality (scenarios available on different ERM training systems)
- **Higher technician/engineer level:** creation of projects and scenarios of augmented reality on SolidWorks/Catia Composer and Diota to assist operators and technicians

Job Card (maintenance scenario)
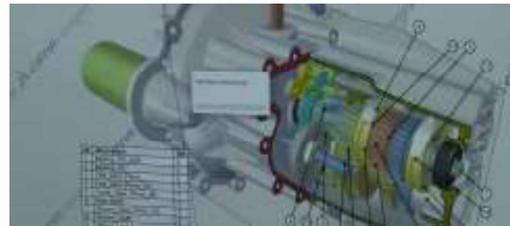
Creation in Catia / SolidWorks Composer

Réel   Réalité Augmentée   Virtuel

Virtual Universe Pro - Simulation on digital twins

Modelling and simulation (on PC or immersive headset) of virtual systems in a 3D environment integrating physical simulation

- **Integration of 3D system models created from an object library or CAD software** (SolidWorks, etc.)
- **Interconnection with real electrical, pneumatic diagrams and PLC programs**
- Control of 3D models in real time by:
    - PLC connected to the computer
    - Software on another computer through an IP connection
    - Virtual controller integrated to the software
- **Digital twins of 5 workstations from the Ermaflex production line are available**

www.erm.li/vup

- Perfect for learning programming on a PLC (real or virtual)
- Multiplication of workstations without any risk of deterioration
- Site licence (unlimited number of computers)

Ermaflex programmable 3D simulators

Dynamic 3D simulators of 6 Ermaflex workstations

- **PLC programming** (Grafcet and GEMMA design its the integrated editor)
- **System control** with the virtual HMI
- **Maintenance diagnostics**

Process

Maintenance module

Multitec

Polyprod

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