

Automation platform  
**Modicon Quantum**  
*Choose* availability





# Simply Smart!\*

At the heart of Telemecanique's offer, Unity is the new generation software and hardware automation platform.

Its sheer **ingenuity** reduces development times, and its processor **flexibility** offers greater execution performance.

Based on **openness** and the collaborative use of tools, Unity has reached a higher level of software development and control system operation that puts your productivity first.

> **Develop**  
Programming, debugging and operating software for automation applications.



Programming software

> **Collaborate**  
VBA, VB, C++ programming interfaces.



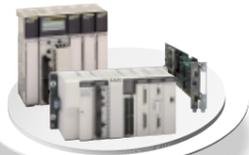
> **Generate**  
Process design and applications generation.



> **Orchestrate**  
Projects management for "Collaborative Control" applications.

Specialized software

> **Operate**  
Unity processors: Modicon Premium, Atrium and Quantum.



PLC

True to the goals of Unity, the Modicon Quantum PLC includes a new redundancy module to ensure the availability of your system. Its powerful new processors offer optimum cycle times combined with even more communication functions, diagnostics, memory flexibility and data storage.

## Hot Standby, increased availability...

When combined with Unity Pro programming software, the Hot Standby offer effectively meets the needs of users: more memory, enhanced performance, and built-in hardware redundancy. What's more, it also offers supremely easy system setup and improved management and communication functions - all without impacting performance.



Transparent Ready

## Naturally communicative

Transparent Ready is the successful combination of Internet and industrial communication technologies. With an Ethernet TCP/IP port and a web server directly integrated in the top of the range processors, the use of standard and open protocols, synchronization mechanisms and the ability to distribute I/O, Quantum offers the best of Ethernet.



\*Simply Smart: smarter and more intelligent, yet even easier to use.



## An ideal platform for Process Control and Infrastructure applications...

### Powerful processing capacity and memory

With 7.168 MB of program memory and 768 KB for data, its processing capacities are higher than ever before. The PLC can hold the complete source project, process complex data structures, time stamp diagnostic information at source, and store recipes or tracking data.

### Open-ended solutions

With its modular and flexible architecture (extension racks, processors, PCMCIA memory...), Quantum meets the needs of the most complex applications, in both centralized and distributed topologies.

Its flexibility in development and use, in terms of both hardware and software, simplifies application modifications as and when your process evolves.

### Availability and efficiency ensured

A redundant coprocessor, housed in the same case as the CPU processor, has a dedicated built-in Ethernet port (100BASE-FX) for data exchange between the Normal and Emergency processors.

Offering up to 128 KB of located data and up to 512 KB of unlocated data that the process context is preserved in the event of redundancy without restricting program size.



## Food processing

- Huge data storage capacity (recipes, tracking...)
- Reduction in downtimes through simple, effective diagnostics, with no impact on cycle times
- Individual or grouped modifications, online and in runtime
- Representation of the application by process functions



### Amazing performance

- Top of the range processor  
150 CPU 651 60
- Instruction execution time:
  - Boolean: 0.052  $\mu$ s
  - Numerical: 0.045  $\mu$ s
  - Floating point: 0.4  $\mu$ s
- Memory:
  - Program: 7.168 MB
  - Data: 896 KB
  - Storage: 8 MB



## Metallurgy

- Hardened "Conformal Coating" modules (I/O and processors)
- Total redundancy solutions:
  - > Power supply redundancy
  - > Cable redundancy
  - > Processor redundancy (Hot Standby)
- Modules can be changed with the system switched on in total safety



## Chemicals - Petrochemicals

- Intrinsically safe discrete and analog I/O modules
- High-availability Hot Standby solution
- Full control library as standard



## Pharmaceuticals

- Huge data storage capacity (recipes, tracking...)
- Data security through controlled access to the application
- Logging of operator actions in a secure file in accordance with the FDA recommendation 21 CFR 11



## Energy infrastructure

- High-availability Hot Standby solution
- Long-distance distributed architectures (fiber optics)
- Built-in communication ports conforming to market standards:
  - > Modbus
  - > Modbus Plus
  - > Ethernet TCP/IP
  - > USB terminal port

# Flexibility

## Choose a made-to-order architecture

### Low-cost, high-performance solutions for any configuration

The I/O can be used in three different ways:

- As local I/O (in the base rack)
  - > Typical racks with 6, 10 or 16 positions
  - > Unlimited number of I/O words
- As remote I/O (RIO – S908)
  - > 31 I/O stations maximum
  - > Single or redundant coaxial cable topology
  - > Point-to-point or ring remote fiber optics
  - > Maximum distance without repeater 4572 m
  - > Compatible with former generation I/O (800 series, Symax)
- As distributed I/O (DIO)
  - > 63 I/O stations maximum
  - > Twisted pair/Modbus Plus topology
  - > Single or redundant cable topology
  - > Maximum distance without repeater 457 m
  - > Point-to-point or ring remote fiber optics
  - > 3 networks maximum per PLC
  - > Compatibility: (Momentum, Advantys STB, Altivar...)



# Reliability

## A more powerful redundant system

### Operate in total serenity

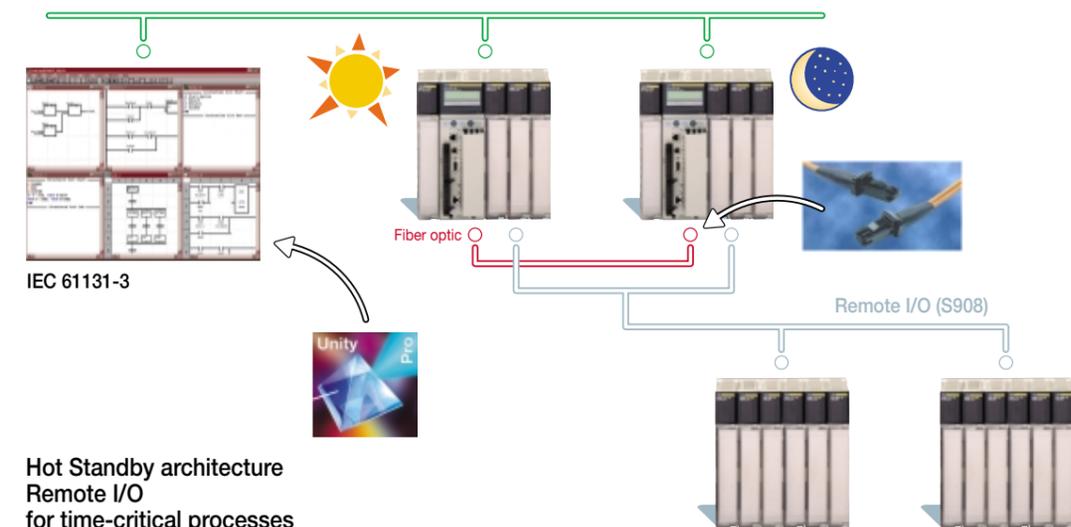
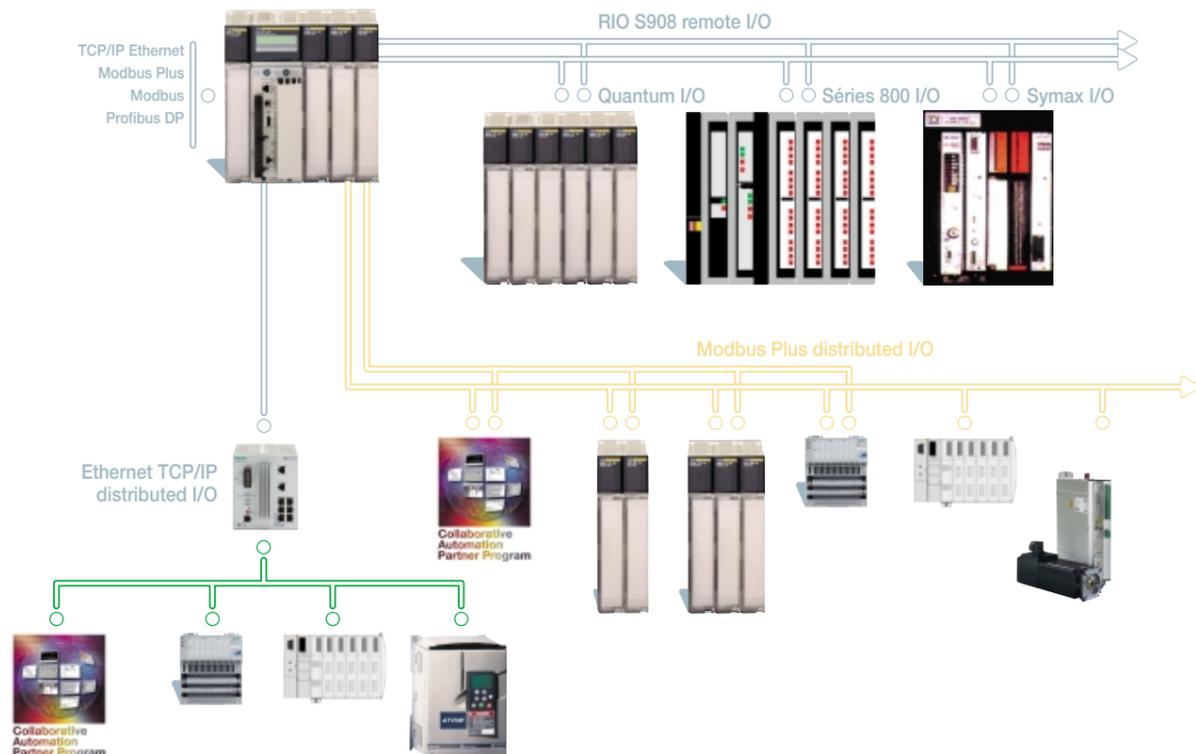
The new Quantum 140 CPU 671 60 Hot Standby processor is designed for critical applications demanding high-availability control system architectures, where system stoppages are out of the question. The Hot Standby solution is based on a Normal/Emergency principle, which ensures switching without loss of process control in the event of a fault.

### A consistently powerful system

The components in the latest generation Quantum CPU modules, in particular module 140 CPU 671 60, represent technology at its best. These modules house two major functions: the PLC processor, and a coprocessor dedicated exclusively to redundancy.

### Ensure the reliability of key functions

The Normal/Emergency Hot Standby architecture provides passive redundancy of the hardware base that manages processing and communication in the PLC. This improved reliability relates to the key functions that ensure uninterrupted process management and control. The remaining architecture is conventional, keeping the overall system budget under control.



# Availability



# Expertise



## Forget production stoppages

### Outstanding efficiency

The exchange of data between the two PLCs, Normal and Emergency, utilizes the 100 Mbps Ethernet port provided as standard on the CPU module. All data is exchanged every scan cycle, with minimal impact on the system cycle time. The two PLC CPUs can be up to 2 km apart. The I/O stations have a conventional RIO topology (S908) as standard.

### No restrictions

In brief, Quantum Hot Standby means:

- A customized CPU, but no specific additional hardware module
- No programming: the basic system management parameters are defined in just one dialog box
- Clear operating modes, activated from the micro-terminal on the front of the CPU module, from a programming PC, or from a supervisory station
- Application programs can differ between Normal and Emergency, without interrupting the redundancy coupling

Satisfying the user's productivity requirements, choosing Quantum Hot Standby means total availability of the management system. It opens the door to a whole range of possibilities offered by Unity Pro.



## Advanced process control... Create system architectures in the image of your process.

### A complete library...

A process control library comes as standard in Unity Pro, and is compatible with all Quantum processors.

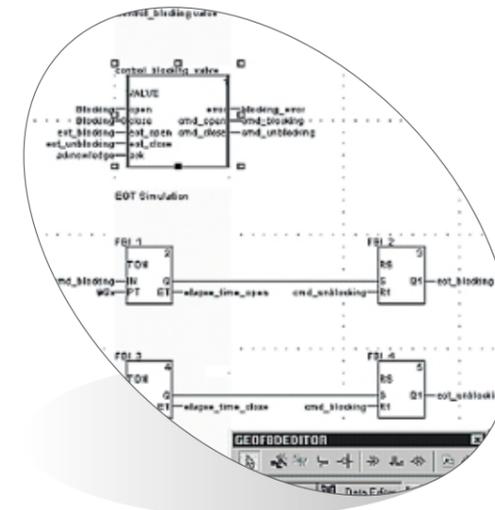
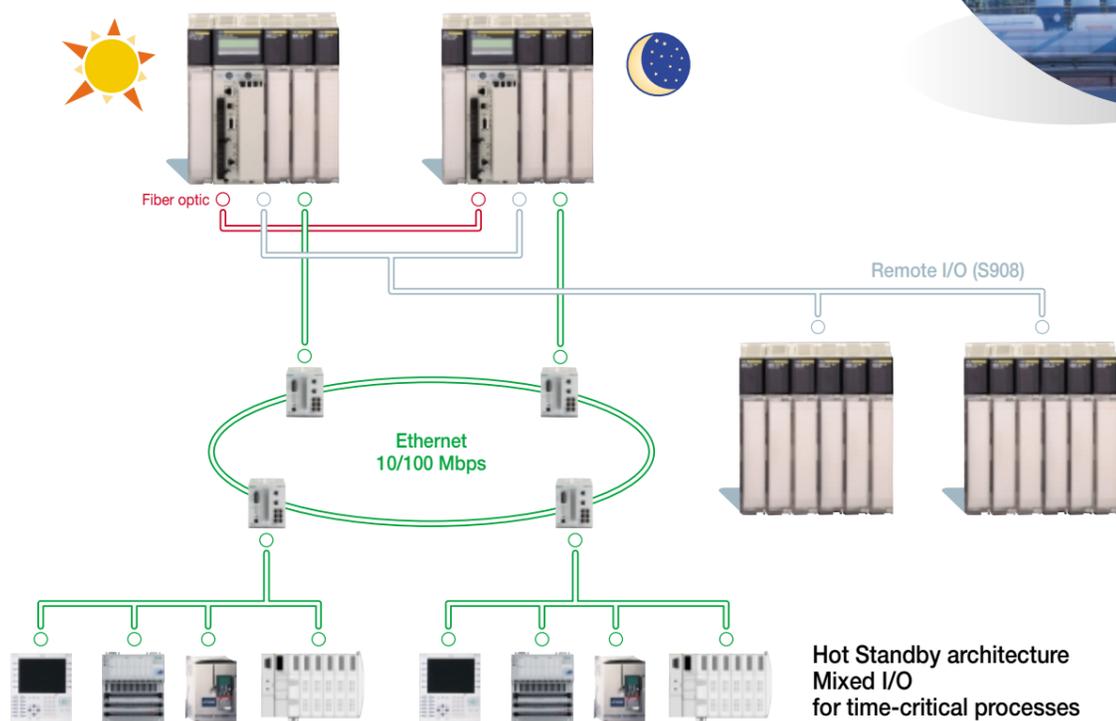
In addition to multi-structured PI and PID standard function blocks, the library contains several additional blocks for programming your process control strategy in the image of your process, down to the last detail:

- Integrator with limiting values
- First/second order dead time and delay term
- First and second order variation limiter
- Two -or three- position controller
- Hot/cool PI controller
- Function generator
- Switching of PD/PI controller structure
- Pulse width modulation
- PIP and PPI cascade controller
- Mass flow controller
- Scaling of all discrete values
- PID Autotune, etc.



### FBD included in Unity Pro

The function block diagram language, a standard defined by IEC 61131-3, enables the graphic representation, modification, and realtime display of function blocks, and it is integrated within the Unity Pro programming package.



## A graduated range of processors

140 CPU	31110	43412 A/U	53414A/U	65150	65160	67160
Bits/module local rack	1024/1024	1024/1024	1024/1024	1024/1024	1024/1024	1024/1024
Local rack	Unlimited I/O words					
Extension racks	31	31	31	31	31	31
Communication modules	2	6	6	6	6	6
Integrated Ethernet port				■	■	
Integrated USB port				■	■	■
Internal memory	400 kB	800 kB	2,7 MB	768 kB	896 kB	896 kB
Including "State RAM"	20 kB	128 kB	128 kB	128 kB	128 kB	128 kB
Extension capacity				■	■	■
Max Program with extension				7 MB	7 MB	7 MB
Max Data with extension				640 kB	896 kB	896 kB
Max File with extension				8 MB	8 MB	8 MB

## Increase your productivity through heightened awareness

### A customized environment

By setting simple parameters, graphic screens can be used to set up complex specialized functions in line with the usual practices specific to each application area.

The integration of external files in our Unity software using hyperlinks simplifies the overall management of your application.

The Unity environment can integrate all your own functions developed in VBA, to automate repetitive operations.

### Libraries for your standards

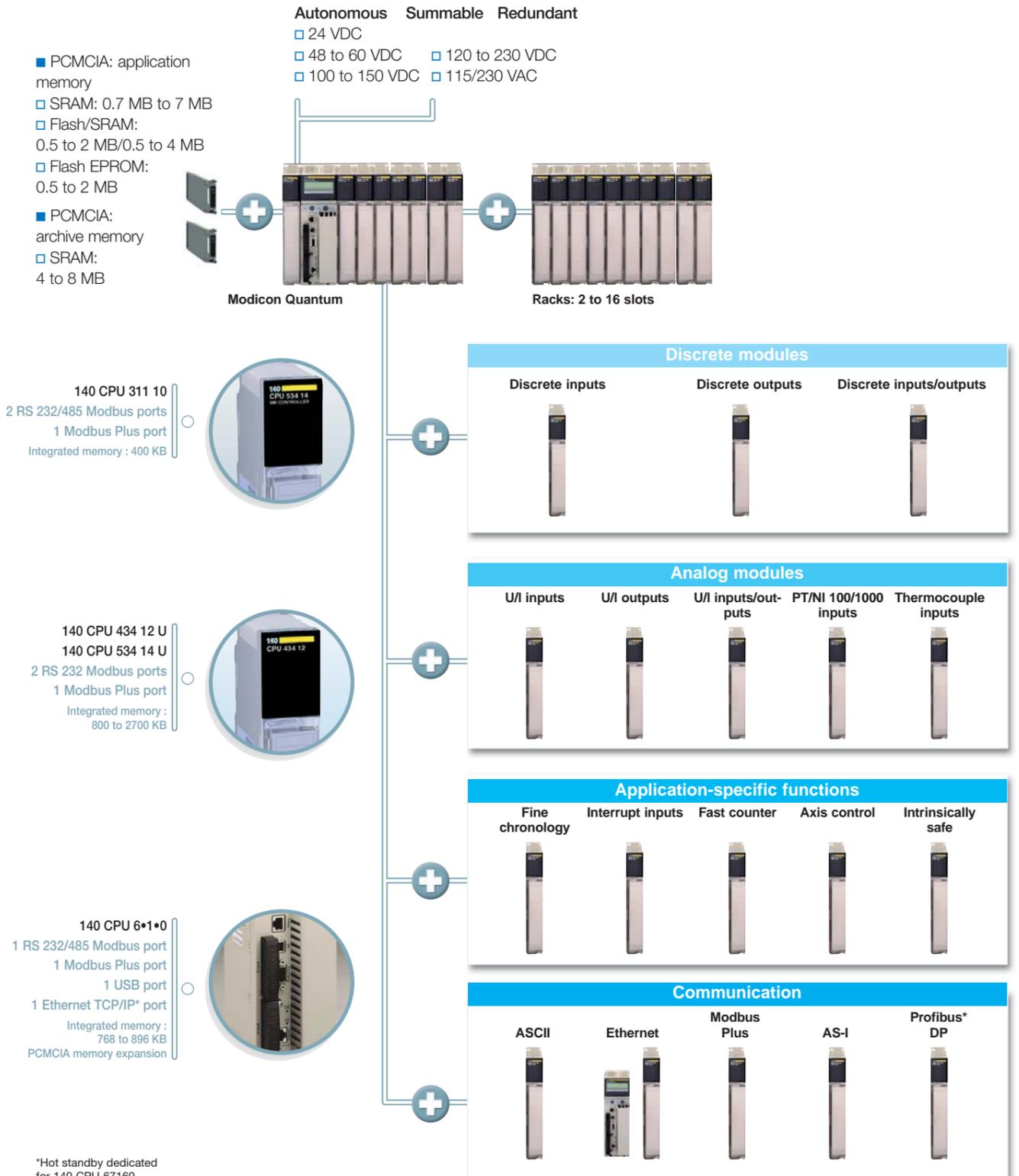
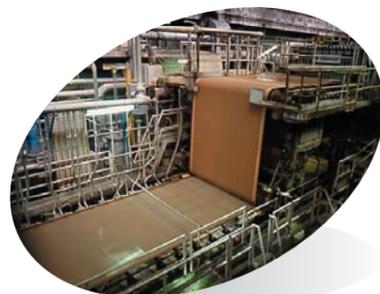
Access genuine object-oriented programming: elementary functions can be encapsulated in function blocks and data structures can be organized into control system objects.

By adding your own objects to the library in this way, you can control the development of your applications, prepare for future developments and share access to your expertise.

### A functional approach

You are free to organize your application into "process functions" for direct access to the required function using a simple browser. For distributed architectures, Unity Studio extends this functional approach beyond the PLC station, to project level.

This approach can be based on the S88 model relating to resource sharing in Batch applications.



# The efficiency of **Telemecanique** brand solutions.

When used together, Telemecanique products offer quality solutions that will meet all your **Automation** and **Control** application requirements.



## A global presence in 130 countries

■ Permanent availability, worldwide. With more than 5000 sales outlets in 130 countries, you will always find a complete range of products that meets your needs and conforms to local standards.

■ Technical support wherever you are. Schneider Electric provides technical assistance around the world, with experts at your service to help you achieve the optimum solution for your particular application.



[www.telemecanique.com](http://www.telemecanique.com)

*Simply Smart!*

**Schneider Electric Industries SAS**

Registered office  
89, bd Franklin Roosevelt  
94504 Rueil-Malmaison  
FRANCE

[www.schneider-electric.com](http://www.schneider-electric.com)  
[www.telemecanique.com](http://www.telemecanique.com)

Due to possible changes in standards and equipment, the features described in this document in the form of text and images are subject to confirmation by Schneider Electric.

Design: Pema-Cohérents  
Photos: Schneider Electric - Image bank