

# Revolutionizing Past's Innovative Disruption to Future Mechatronic Development

by Sylvain Mathys, CEO at Mecatix

20 November 2020

The history of art, science, and technology provides many examples of rapid change. In an interesting contrast to that, robots seem to have a timeless, universal quality to them. Consequently, it was thought-provoking to learn some of this history occurred right in Mecatix's backyard, La Chaux-de-Fonds.

During a recent visit to the Neuchâtel Art and History Museum, it was a reminder of the importance of theory and intricate design calculations in any given project and that it is equally critical to continue evolving and revolutionizing while remembering and learning from the past.



Source: J3L Homepage

## Evolution of Automata to Robots

The first records of automata, or self-operating machines that give the illusion of being alive, go back to ancient Greece and China. Fast forward to the European renaissance; machinists built life-size, doll-like automata that produced the startling illusion of humanity. These objects of fascination were reserved mainly for the enjoyment of the rich.

By the nineteenth century, the craze for automata spread throughout the world, and devices began to demonstrate ever-increasing levels of sophistication. The term 'robot' was first applied as a term for artificial automata in a 1920 Czech play. Robots have since postulated an image of technological, blinking, metal, artificial beings. Before then, the term automata had been used for thousands of years to convey the same meaning.

## Swiss Automata Trio Debut

In addition to its presence in the watch industry, Neuchâtel has made a name for itself as the home of the world's first known robots, dating back to the 1700s.

In 1768, the Swiss watchmaker, Pierre Jaquet-Droz, began to create The Writer, his first of several automata. In the following years, with his son, Henri-Louis Jaquet-Droz and his fellow clockmaker and adopted son, Jean-Frédéric Leschot, he also created The Musician and The Draughtsman. The three automata, first shown in the Jaquet Droz atelier in La Chaux-de-Fonds, Switzerland, in 1774, were soon traversing the royal courts of Europe, China, India, and Japan to demonstrate the trio while also growing their watchmaking business.

## Compelling Mechanical Design

The design and mechanical motion of the Automata Trio showed revolutionary innovation for its time. The internal structures of the automata comprise intricate brass wind-up mechanisms - with thousands of pieces within the body of each of the automata.

The Writer is a child sitting on a stool, holding a quill to a mahogany table. He is wound up and given a piece of paper. By dipping his quill in an ink pot and shaking it gently, he can write a pre-programmed text. His eyes follow the writing with focus and intent. The Draughtsman, also a young boy, is capable of producing four drawings — a dog, a portrait of Louis XV, a royal couple, and Cupid driving a chariot pulled by a butterfly. He fidgets in his chair and occasionally blows dust from his pencil. The Musician is a full-size adolescent girl who plays a non-automatic organ by pressing the keys with her fingers. She appears to watch her fingers, breathe, and adjust her body as a real organist would.

Illustrating the intricacies and honed details of design ahead of its time, The Writer's mechanisms feature a fully self-contained 'programmable' writing machine that some consider being the oldest example of a computer. The wheel makes it possible to choose the words the figure writes, and a 'memory' made up of nearly 6,000 parts and 40 distinct of cams and connecting rods to transform rotary into linear motion. These control a letter-forming mechanism of more than 4,000 components, thanks to which the robot can write any text that does not exceed 40 letters or symbols on three lines.



Rear metal casing of the body revealing intricate components

## Yesterday's Evolution to Future Mechatronics Revolution

In this age of global competition, the spirit of entrepreneurship, imagination, and innovation, we can continue to evolve. We have gone from microscopic to nanoscopic, petroleum to renewable energy, from analog to digital ...let's continue to learn from our past and go far beyond what is accepted today.

Sources: [www.swissinfo.ch](http://www.swissinfo.ch), [www.houseofswitzerland.com](http://www.houseofswitzerland.com), [www.gwsrobotics.com](http://www.gwsrobotics.com), [www.collectorsweekly.com](http://www.collectorsweekly.com), New York Times, "Automatons and Ingenuity"



**PERSONALISE WITHOUT COMPROMISE**

Mecatix SA  
Rue Fritz-Courvoisier 40  
CH-2300 La Chaux-de-Fonds  
Switzerland  
T : +41 32 968 968 0