Smart Vending & Telemetry
WE MAKE IT YOURS!
**IoT / Telemetry**

Our entire FTL Smart Vending machine controller family features an expansion slot, which makes adding telemetry functions to your controller extremely easy. Simply plug in the Garz & Fricke Connect VMC modem and fit the antenna into the machine. Done! The telemetry-based G&F Connect Cloud Solution provides you with error messages and enables predictive and remote maintenance.

**Human Machine Interfaces**

We offer a wide range of rugged high-resolution and high-brightness Human Machine Interfaces with PCT touch technology to run and display an efficient GUI.

**Vending Machine Controller**

SANTVEND is a modern, newly developed Linux-based vending machine control system. An MDB (Multidrop Bus) interface for connecting payment systems, as well as the 3G/4G modem, make SANTVEND ready for the Internet of Things. The powerful graphics unit allows high-resolution touch displays from 7” up to 32”.

**Cashless Payment System**

KarL² - TOPP

KarL² is the brand new highly integrated and rugged cashless module from Garz & Fricke for quick, safe and convenient payment by girocard contactless and mobile phone via NFC. It can easily be integrated mechanically, with the small dimensions allowing the upgrade of many existing vending machines.

**VMC Accessories**

Garz & Fricke’s range of vending machine accessories includes service tools and solar panel.

**Cash Payment Systems**

We have developed our own custom coin changers and banknote readers, which are available exclusively from us.
**KarL⁴ – the quick, fast & safe TOPP cashless payment module**

KarL⁴ is the brandnew highly integrated and rugged cashless Module from Garz & Fricke for quick, safe and convenient payment by girocard contactless and mobile phone via NFC [Credit Card support coming soon].

It can easily be integrated mechanically, with the small dimensions allowing the upgrade of many existing vending machines. Its extremely low power consumption and the fastest wake-up from sleep-mode, compared to other available products, makes KarL⁴ the best choice for battery-powered applications.

The integrated Plug & Play setup works via a single MDB line and is used to control the system completely. KarL⁴ is mechanically downwards compatible to its predecessors, such as KarL³.
State-of-the-art vending machines

Making a vending machine “smart”

We didn’t invent the smart vending machine but we have perfected it over the decades. What began 25 years ago with alarm systems for cigarette vending machines is now almost the perfect fit for all kinds of state-of-the-art vending machines. Our systems are characterized by

- sophisticated software and hardware
- intelligent energy management
- one single user interface for service technicians
- and optional telemetric connection to back-office databases

They can be equipped with

- banknote readers
- coin changers
- payment systems
- and many other accessories

From mechanical machines to modern smart vending systems

The demand for vending machines with a user-friendly guidance is becoming increasingly important. Today’s vending machine operators are facing users who expect the machines to employ modern touch technology.

What are the main differences between a classical machine, as can still be found in large numbers in the field and a modern user-friendly smart vending system?

The design of classic vending machines is usually characterized by the use of

- small monochrome, character-based displays
- mechanical keypads for product selection,
- controlled by a microcontroller
A first option is to design an improved system where the HMI is connected to an already existing controller via a COM interface. System management and payment operations will continue to be managed via the controller board. This offers:

- a graphically designed user interface with touch-technology
- a modern look & feel

The ultimate and preferable way to design a modern smart vending design is to replace the old control system with a Garz & Fricke HMI. This means:

- the HMI contains all the system intelligence. It handles the graphic user guidance, product management, payment systems and machine communication
- only a small I/O board is needed to control the dispensing of the goods
- it opens up an easy way to the Internet of Things.

The MDB manager - the software library for an easy interaction

Since a standardized protocol is important for the easy integration of components, we have developed the MDB manager, a Linux-based middleware solution, which

- permits quick and easy integration of payment peripherals and faster design of payment processes
- encapsulates the MDB protocol and supports the cash and cashless payment process
- is available with Linux-driven MDB solutions from Garz & Fricke
- includes Garz & Fricke payment peripherals: KarL³, KarL⁴, currenza c² silver, ICT x7plus and others on request
- is planned to support API in C, API in C++/Qt
Besides our HMIs, telemetry hardware (add-on boards for standard vending machine controllers, modems on board, mPCIe-slots for wireless communication modules) and payment peripherals we offer more services and solutions for helping the modern smart and connected vending machine to become real.

At Garz & Fricke, we have experience in supporting our customers when establishing their own vending machine network and we also provide services for the handling of cashless transactions.

For tobacco vending customers, Garz & Fricke has implemented a network of more than 50,000 vending machines in Germany, Austria and Switzerland, which are connected on a secure basis.

The communication is exclusively possible between the respective smart vending machine and the data centre. Currents states or actions such as

- filling status
- technical parameters for predictive maintenance
- software updates

can be monitored or activated by the operator’s web application.
Outdoor display technology

Besides the typical indoor solutions, vending machines have always been a tough outdoor business. This means that touch displays, solutions and HMIs need to fulfil specific requirements. For this reason, Garz& Fricke offers outdoor-ready systems available for customers focusing on:

- extended temperature range
- 4.0 mm glass and 5.0 mm glass with milled glass step for additional protection against vandalism
- optical bonding as an option
- high-brightness displays with 850 cd/m² and more
- ambient light sensors for automatic adjustment
- sizes ranging from 7” to 46”

On request, to keep design options as flexible as possible, we can also offer touch displays without a single-board computer, providing LVDS or HDMI for display connection and I²C or USB for touch connection.

Garz & Fricke has additionally specialized in offering optical bonding for touch displays: glass, touch and display are mounted with a transparent adhesive.

Your advantages of optical bonding are:

- reduced reflections and increased ambient contrast ratio and viewing angle
- stronger glass-touch-display connection providing more protection in the case of vandalism

Typical outdoor solutions which offer optical bonding are

- Santaro 7.0” OF PCT IPS outdoor (900-3433R),
- Santvend 7.0 OF PCT IPS (903-0618R)
- Santoka 15.6” OF PCT IPS outdoor (900-3992R)

Those HMI’s are mechanically designed to be flush-mounted into a typical vending machine front, additionally providing protection against vandalism and fulfilling environmental requirements.