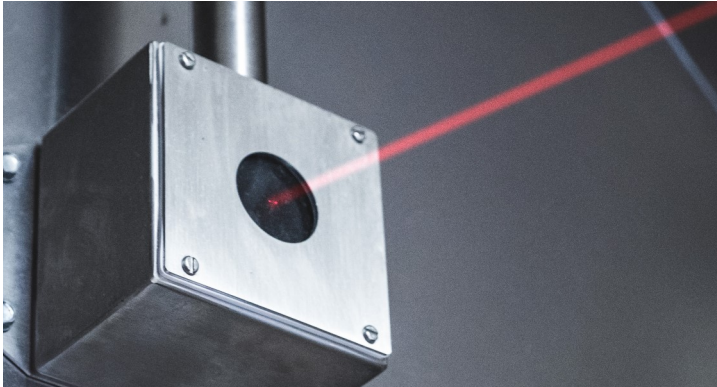


# Data Sheet

## Cheetah



### System overview

Cheetah is an intelligent demand-control ventilation (DCV) system designed for commercial kitchens and foodservice operations. It autonomously adjusts fan speeds based on real-time cooking activity, optimizing energy use without compromising air quality.

### Key Features

- Energy, utility and carbon savings: Save on fans energy consumption, reduce utility costs and CO2 emissions
- Autonomous fan speed adjustments: Remove the need to manually change speeds or staying at full speed
- Steam, smoke and temperature sensors: Recording cooking activity on the cookline
- Improved air quality: Removing smoke, grease and odours during periods of high cooking intensity and conserving energy at low levels of cooking without compromising air quality
- Remote diagnostics: We can remotely dial into our system and change settings, avoiding call-out fees
- Live data: Our data logger can record live data to showcase the savings
- Integration into existing BMS systems: Seamless integration into BMS with BACnet IP protocol
- Retrofit or new build solution: Cheetah can be installed into new or existing ventilation

### How it Works

Sensors are installed in the canopy and ductwork to monitor the cooking activity on the cookline. Cheetah slows down the fan speeds to as low as 40% during low-demand periods, which uses only 6.4% of the required power. When smoke, steam, or high temperatures are detected, the system automatically increases fan speeds to meet extraction demand. This intelligent modulation ensures optimal ventilation throughout kitchen operations, delivering energy savings up to 80% while maintaining a safe and efficient cooking environment.

Typically, you can achieve a return on investment in under 2 years.

Scan me

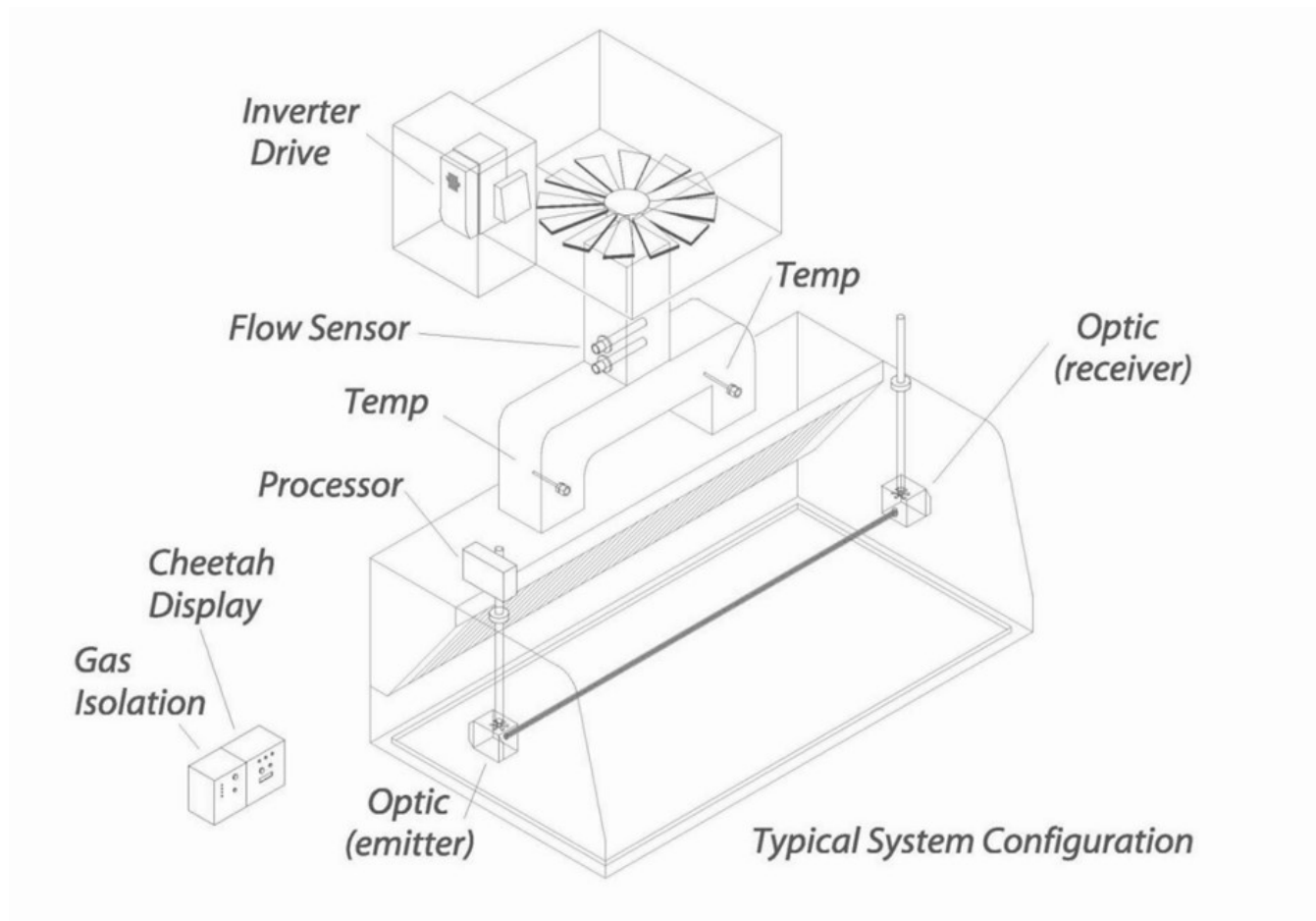


**Cheetah**   
Ultimate Energy Control

# System Components

## Cheetah

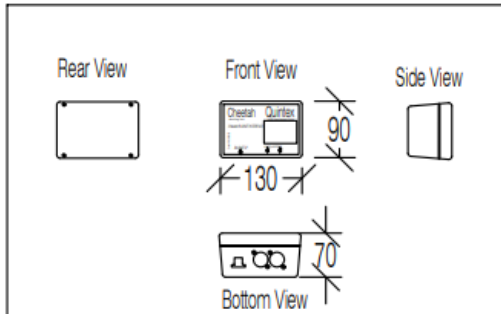
System Components	
<b>TEMPERATURE SENSORS</b>	Cheetah temperature sensors are (usually) mounted in the extract canopy ductwork. They are in the main airflow.
<b>OPTIC SENSORS</b>	Cheetah optic sensors are Class-2 devices that include additional block detection safety protection. They are installed in pairs and span the length of a canopy.
<b>DISPLAY UNIT</b>	The Cheetah Display unit provides an operator interface with the Cheetah system
<b>SENSOR-PROCESSOR UNIT</b>	Cheetah Sensor/Processor is a local HUB unit into which the relevant temperature and optics sensor equipment is plugged.
<b>VARIABLE FREQUENCY DRIVE</b>	Typically, the VFD is a Vacon 100 speed controller that is used to vary the speed of the connected fan, based on the control from the Cheetah system. Other VFDs may
<b>DATA-LOGGER (RCDLU)</b>	Cheetah Remote Communications Data Logger Unit provides direct communications to the Cheetah system via a GPRS modem. It can be accessed by the Quintex technical department.



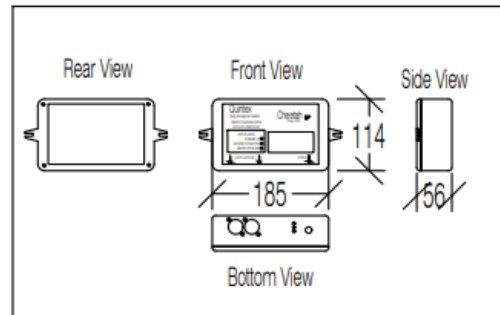
# Technical Drawings

## Cheetah

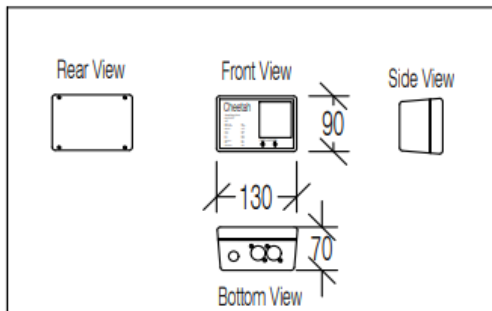
BACNET INTERFACE



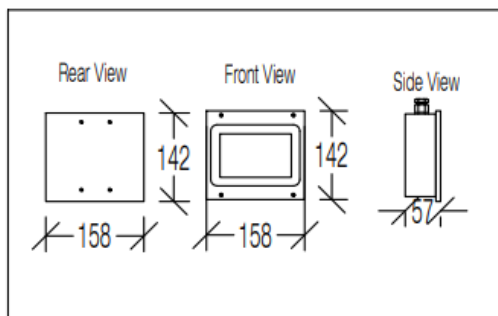
Data Logger



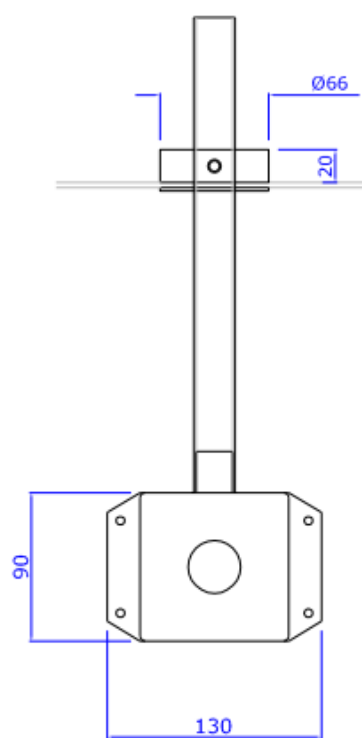
GPIO



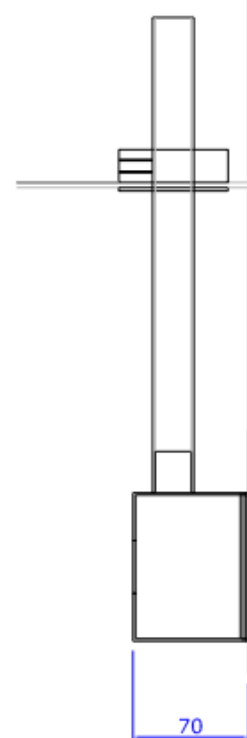
DISPLAY



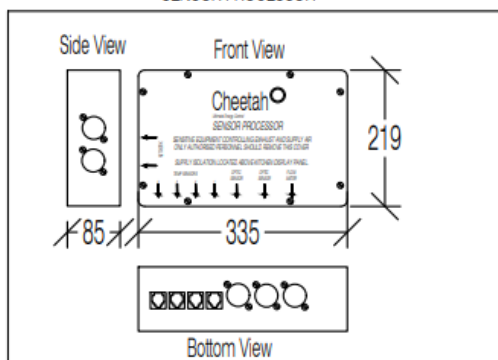
FRONT VIEW



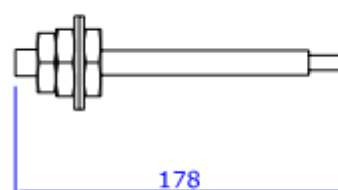
SIDE VIEW



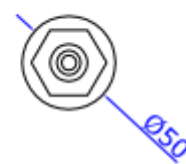
SENSOR PROCESSOR



Optic Sensor  
(mounted in pairs)



Temperature Sensor



# Technical Dimensions

## Cheetah

Display Unit	
Width	160mm
Height	140mm
Depth	55mm

Processor Unit	
Width	190mm
Height	120mm
Depth	60mm

Data Logger Unit	
Width	150mm
Height	100mm
Depth	60mm

BacNET	
Width	165mm
Height	85mm
Depth	55mm

GPIO	
Width	125mm
Height	85mm
Depth	55mm

Optic Sensor	
Width	130mm
Height	90mm
Depth	70mm

Temperature Sensor	
Width	50mm
Height	178mm

4G Data Logger	
Width	165mm
Height	85mm
Depth	55mm

# Affinity Laws

## Cheetah

### Affinity Laws Principle

The Affinity Laws for centrifugal loads explain how changes in fan speed impact energy consumption. According to these principles, fan power consumption is proportional to the cube of its speed. This means that reducing a fan's speed significantly decreases its energy use. For example, running a fan at 50% of its full speed requires only 13% of the energy needed at 100% speed. Cheetah applies this principle by adjusting ventilation fan speeds based on real-time cooking demands, ensuring extraction rates are optimized while minimizing unnecessary energy waste.

The three key Affinity Laws are:

1. Airflow (Q) is proportional to fan speed (N):

$$Q_1/Q_2 = N_1/N_2$$

This means that if the fan speed is reduced to 50%, the airflow will also reduce to 50%.

2. Pressure (P) varies with the square of the fan speed:

$$P_1/P_2 = (N_1/N_2)^2$$

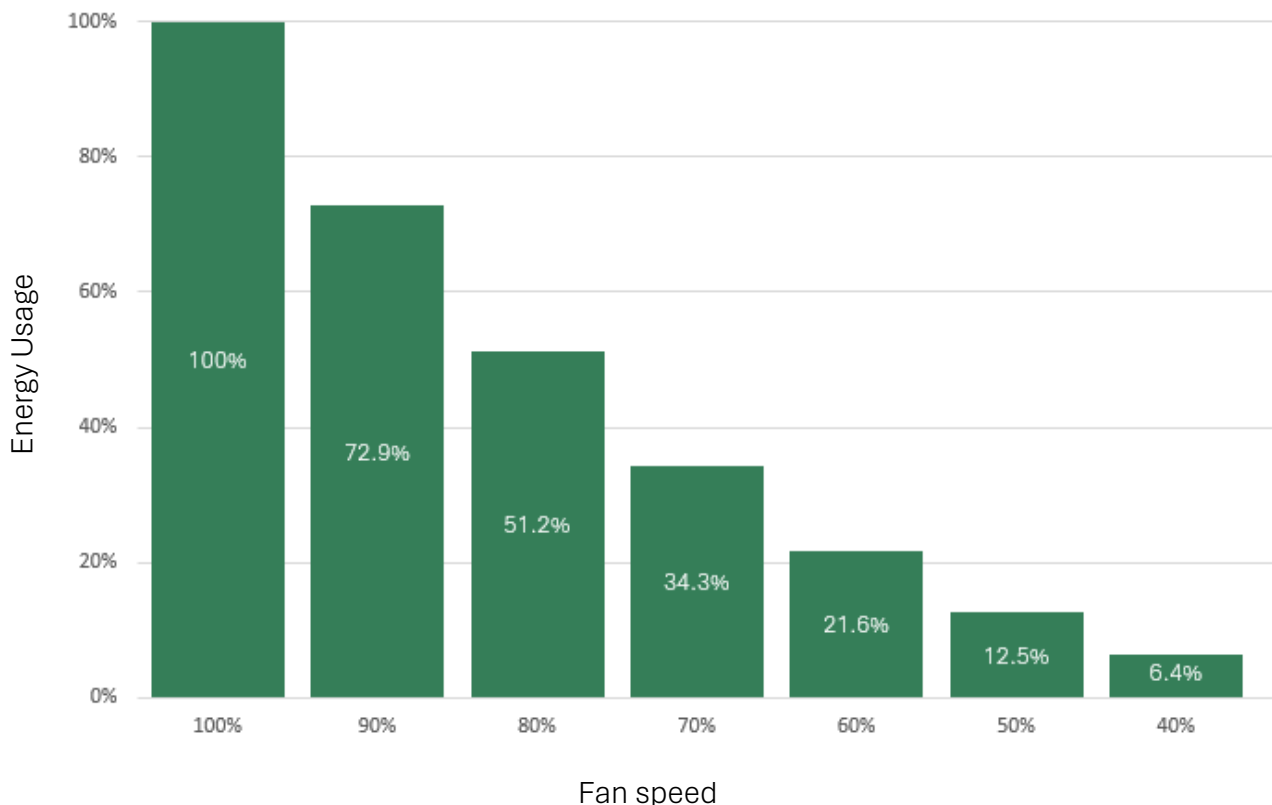
If the fan speed is reduced to 50%, the pressure drops to 25% of its original value.

3. Power consumption (W) is proportional to the cube of the fan speed:

$$W_1/W_2 = (N_1/N_2)^3$$

This is the most significant law for energy savings. It means that reducing the fan speed to 50% results in only 12.5% of the original power consumption.

This graph shows the fans energy usage at each speed set point. I.E at 90% fan speed it uses 72.9% of the energy required.

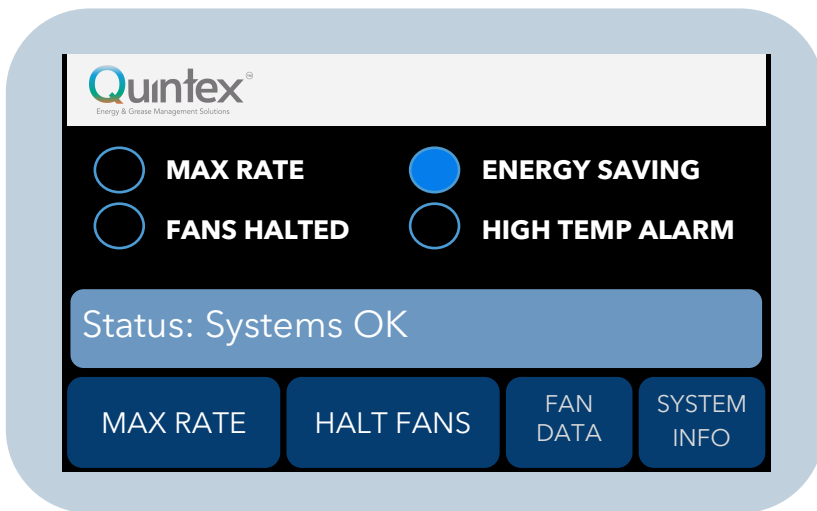


# Operating Instructions

## Cheetah

### User Reference Guide

The Cheetah system is designed to automatically control the speed of the extraction canopy ventilation fan/s, based on the demand from cooking activity. The system will operate the fan/s between (%) minimum & maximum speeds. If there are any other fan controls (switches, BMS, electrical isolators, etc) these need to be switched on before the Cheetah system can control the fans.



The screen will be backlit to verify that the Cheetah System has mains power.

The ENERGY SAVING indicator will be illuminated blue whenever the fans are running at below 100% operation.

The ALARM HIGH TEMP indicator will be illuminated when the sensors in the ductwork detect an abnormally high temperature which may indicate a duct fire. The temperature at which this function activates is configurable by Quintex but defaults to 99° - should the temperature in the duct be this high, an alarm will sound from the Display and immediate action should be taken. Please call the number on page 2 of this document.

The Display Unit features an LCD touchscreen with options for user input. The MAX RATE option ramps up the fans to full speed for a pre-set length of time (the default system override time is one hour) At the end of the pre-set override period (or when MAX RATE is pressed a second time) the system will revert to demand-controlled operation.

The HALT FANS button will command the fans to stop running. There will be a confirmation screen after this is pressed to ensure that the user wants the fans to stop, asking the user to press YES or NO (varies by version) The FANS HALTED text will display a red indicator beside it when the fans have been halted. To bring the fans back on, the HALT FANS (select NO) or MAX RATE option can be pressed.

Pressing the FAN DATA will reveal information on fan speeds and duct temperature.

IF REQUIRED: The connected fan/s can be STOPPED (e.g. overnight) by pressing the HALT FAN button. Pressing the MAX RATE button again will restart the fan/s.

# Specification Summary

## Cheetah

Manufacturer – Quintex Systems

Model Reference – Cheetah

Email - [sales@quintex.co.uk](mailto:sales@quintex.co.uk)

Phone Number - 01189 739 310

Description – Demand Controlled Kitchen Ventilation Control (Energy Saving)

Details – Kitchen Variable Speed Fan Control

*Provide a kitchen fan energy management and safety control to control the extract and air supply fans always ensuring that they run at the lowest speed to minimise energy usage, whilst maintaining comfortable and safe conditions*

### Standard Cheetah System Comprising:

- Cheetah Canopy Optic Kit (Smoke & Steam)
- Temperature Sensors (Temp Sensitivity)
- LED System Display
- 0-10v GPIO Input output Connection to extract and supply fans
- Realtime Remote Monitoring & Data processing of operating parameters.
- Energy Monitoring and Metering
- Ensure full coordination with other trades to provide a complete and operational system.
- Full System Installation.
- Recommended by the manufacturer to take out a service agreement to maintain the manufactures 12-month warranty.

For specifiers/consultants