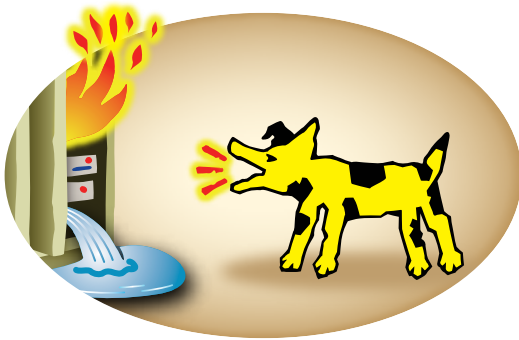# Server Room Climate & Power Monitoring

How to Protect Computer Equipment Against Damage & Downtime Using Low-cost, Web-based Devices.

By the Staff of IT WatchDogs

Read About
the $150,000 Thermostat
& Other Useful Information
to Protect Your Server Room

*"The WeatherGoose warned us twice of an
air conditioner failing. We avoided disaster."*

> *Scott Carlton, IT Manager,*
> *ZWDocs Inc.*

*"Easy to install and one-third of what we were paying
for NetBotz.™"*

> *Brandon DuRette, IT Manager,*
> *Smart Bear Software*

*"The WeatherGoose combined with our portable system
provides the maximum server room protection from
dangerous equipment overheating."*

> *Mike Renier, Vice President,*
> *Kwikool™ Portable Cooling Systems*

SERVER ROOM CLIMATE & POWER MONITORING

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Contents

Introduction

The $150K Sunday meltdown - the cost of new server room equipment. Replacing the gear, reloading the software. Weeks of down-time.

The $150,000 Sunday Cook-in

The meltdown at Acuity software spurred development of low-cost server room monitors- a true story.

The equipment didn't look dead. It looked the same as it did three days ago. No burn marks, no melted faceplates. Even the Cisco logos on the routers were still shiny white. One thing was different: it was very quiet in the server room. Inside, the room normally sounded like a vacuum cleaner, plenty of fan noise. Not today.

All the gear was dead.

Someone set this little guy to 95 F. It did it's job and killed the gear

Our IT manager was removing some servers from the racks and placing them on wheeled metal cart that looked like the kind the food caterers delivered lunch on.

On several units, the tiny lights were fixed on, as if the electronics inside the pizza-box cases were still alive, begging to be freed. No rapid, urgent flicker, as in the past. Just steady pleading from inside of some of the units. Our server room was toast. "All the gear is dead?" I asked.

"Fried. Somebody left the thermostat turned up over the weekend and the heater cooked the gear."

"The heater blows into the server room?" I asked.

"Yes, it blows right in there," he pointed to the ceiling register.

"Any chance you'll be able to save the disks?"

"Very little. The heat sublimates the bearing oil. The drives go dry and seize up. I'm sending them to a recovery shop, just in case," he sounded half-hearted.

I called an IT friend at another company and told him what happened. "It's just a regular office heater. How did this happen?" I asked.

"The heat adds: you have the heat from all the gear plus the heat dumping in the from the ceiling grill," he answered. "I'll bet it was over 110 degrees in less than six hours. Inside the equipment cases it was over 130 degrees. Your gear is scrap, not worth repairing," he gave me no hope.

He asked what kind of software was on the equipment.

"Our internal web and data servers. E-mail, the CRM stuff, and the development guys files," I answered. "Everything except the corporate web site." The corporate web site was hosted in New Jersey.

"Tough deal there," he counseled. "Replacing the hardware will take a week or more. Installing the software could take a month."

"What if we have back-up disks?" I asked hopefully.

"Unless you have the same gear coming in as you burned up, there will be incompatibility problems. How old was the gear?"

"Maybe five years old." The depth of the problem was expanding. We had bought some of the equipment from the last start-up company occupying the building.   We had not installed much of the software ourselves. We probably didn't have all the CD's. Heaven knew where all the license codes lived.

IT gear five years old was considered geriatric equipment. Probably no parts were available and they were certainly long out of warranty. It would be a fresh start on the equipment list.

The Cost of the Meltdown

I asked the lead software developer what was in the room and he gave me a thumbnail list. There were far more machines in the room than I recalled even thought the room had hall windows. I added up his guess at what was lost. Over $100,000, not counting the time needed to re-order the gear. The IT guys had a sizable project.

"That's what the equipment replacement is going to cost. "You have to reload the application software. You do have the CD's around the shop, right?" I answered that we must have them somewhere, but I recalled we

Cost of Replacement Equipment			
Device	Quantity	Cost	Total
Routers	4	$6,000	$24,000
Servers	8	$10,000	$80,000
Switches	2	$1,000	$2,000
UPS	2	$1,000	$2,000
		Total:	**$108,000**

had a complex-looking magnetic tape backup system in the room with the equipment. I wondered if the back-up unit got fried along with the gear.

"The application software is on the back-up tapes?"

Cost of Re-installing Software			
Device	Applications	Days to Reinstall	TotalCost @ $1000/day
Routers	4	5	$5,000
Servers	30	40	$40,000
Switch	2	5	$5,000
UPS	2	2	$2,000
		Total:	**$52,000**

"No, and if it is it's probably and old version. Your guys will probably first reload the Exchange Mail Server and then work on the Pivotal CRM system. The developers can load their own stuff back. All the employee data files should be on the back up tapes." I wondered if anyone had ever

tried a backup. My Power Points were on one of the disks stacked in the hallway. I had two weeks of work in those slides.

Since I didn't know salaries for anyone except myself, I used consultant prices to reinstall the software. I showed my spreadsheet around and most folks thought the cost would be twice that, but come back in two weeks and we'll have a better idea. Nobody felt like talking about the meltdown, much less the IT guys who had become almost invisible.

"Plan on a at least a month getting back up unless you have folks trained on those enterprise-size systems in-house. You'll be feeding CD's into those replacement machines for weeks. Just rewriting the router tables will take a couple of days."

I felt bad about the melt-down. I had been there that winter Saturday when one of us had jammed the thermostat setting to the highest setting, 95 degrees. The heaters must have fully kicked in after we left. We froze most of the day and forgot about the thermostat setting.

Nobody ratted on who set the thermostat, but we were all under suspicion.

I asked various technical staffers who had lost some computer capability when the room melted down how much time we lost. Weeks, easily, they said.

The thermostat cost $50. I never got my PowerPoints back. If I ever built a server room I knew this wasn't going to happen to me.

Comments by Gerry Cullen who participated in the meltdown.
He left Acuity to found NetBotz and, later, IT WatchDogs.
Both are leading providers of server room monitoring equipment.

Monitoring Techniques

Heat: the big problem. Water and unwanted visitors will also bring you down. Where to place sensors. What to monitor. Types of sensors available. Getting alarms. Things to avoid.

Things That Kill Gear

Protecting existing server rooms is difficult because most legacy server rooms are dissimilar and the threats are multiple. One tried-and-true configuration may not work in another server room. This chapter will show a variety of methods to monitor server rooms that have proved effective in five years of instrumenting server rooms.

The five fundamental threats are:

- ▪ Heat, internal and external
- ▪ Water
- ▪ Fire (Smoke)
- ▪ Power Failure
- ▪ Intrusion

Heat Created by Equipment

Almost all the electricity consumed by computer equipment is converted to heat. One feature of heat is it's desire to quickly distribute itself. With multiple cabinets and dozens of fans, the heat becomes uniform through the room. The room feels hot, but there is no glowing stove to demonstrate the amount of heat entering the room.
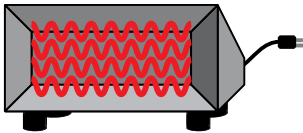
If you moved around with a hand-held thermometer, you would see hot spots, some over ten degrees above the average temperature.

Imagine the equipment replaced by floor heater, the kind found under almost any desk in Minneapolis. A typical heater produces 500 watts and can easily take the edge off a cold cubicle. Now imagine each piece of equipment replaced with a floor heater. A typical PC uses about 300 to 400 watts, not including the monitor. For the sake of easy multiplication, let's say your server room has 30 devices, each consuming 500 watts, for a total of 15,000 watts.

If that number doesn't seem impressive enough, try visualizing 30 floor heaters in the room. Turn all the heaters on and come back in 30 minutes.

= 1000W Heater
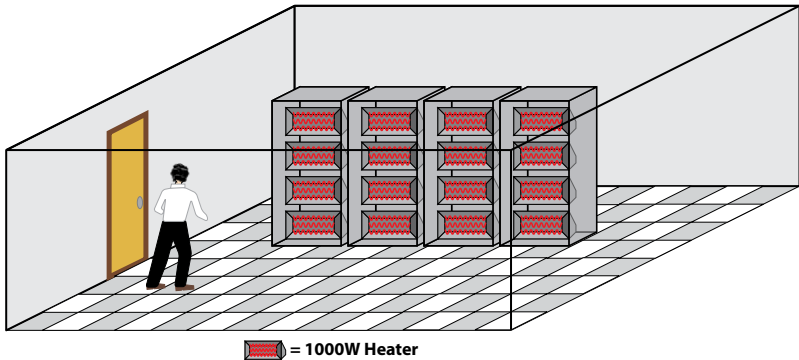
Cabinets full of floor heaters. An illustration to graphically emphasize how much heat is produced.
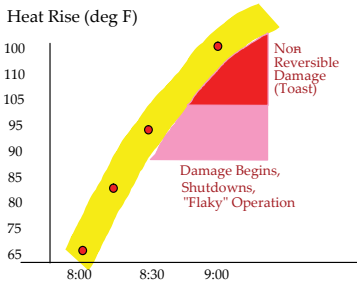
How hot would the room be?

Depending on the room's size and insulation, the temperature could rise 10 degrees F in less than 30 minutes. In an hour the room could be over 100 degrees F.

Computer gear converts almost all the electricity into heat. There is no water pumped or logs sawed (work); other than the internal fans and the disk head arms, 90% of the electricity converts to heat.

Heat Rise (deg F)

100
110
105
95
90
85
80
75
65

8:00   8:30   9:00

Non Reversible Damage (Toast)

Damage Begins, Shutdowns, "Flaky" Operation

A heat gain calculation showed that the internal temperature of the room would increase about 15 degF every thirty minutes. The room rapidly becomes an oven. In most legacy server rooms, the air conditioning system has no margin for error; at best, most legacy air conditioners can barely cope with removing the internally generated heat. There is small or no performance margin.

If the air conditioning partially failed, the room will heat up, and the equipment's maximum operating temperature could be exceeded within only a few hours. If the air conditioner fails completely, the room could be in melt-down condition in as little as an hour, ruining the equipment.

Temperature Inside the Equipment Case

At a recent trade show, two Cisco-certified (CCIE) network maintenance technicians commented on the importance of keeping the equipment within operating temperatures. Here are their remarks:
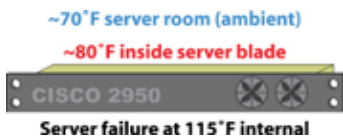
"It's more critical than many IT guys think," said the first technician. "A typical rack-mounted device can run about 20 degrees hotter inside the unit than the outside temperature. "

We told them about our meltdown worries.

"Happens a lot. Heat is the big killer. If the gear doesn't fail outfight it gets flaky."

"What's `flaky'?" we asked.

"Some of the integrated circuits become intermittent because of the over-temperature operation. The silicon junctions in the integrated circuits can't dissipate the heat and they become unreliable, even after the gear cools down. You now have unpredictable equipment.

~70˚F server room (ambient)

~80˚F inside server blade

CISCO 2950

Server failure at 115˚F internal

"For example, a dependable server suddenly becomes unavailable. You can't see the site or read a disk file. Somebody gets mad and starts calling you saying the server's down, so you go racing around looking for server problems. Just as suddenly, the server reappears and the complaints cease. You go nuts. This happens every week. You move stuff to different servers, you drive everyone crazy by pinging the gear every minute. You have flaky gear." He obviously spoke from experience.

The second technician added, "If we have a performance guarantee in our maintenance contract, we can insist on replacing our gear if the room temperature goes above 95F for more than an hour. Once gear gets flaky, it can drive our costs up and our reputations down."

Removing the Heat

Taking the floor heater example one step further, let's cool the room with a dedicated air conditioner. Note the word *dedicated* – many legacy server rooms use existing the building's existing air conditioning system, which adds more complexity because the heat gain in other rooms may change, affecting the air conditioner's performance. A common example of this is when an office copier is added to an office adjacent to the server room. A large copier can produce 1,000 watts of heat when in operation, which the building air conditioner has to remove.
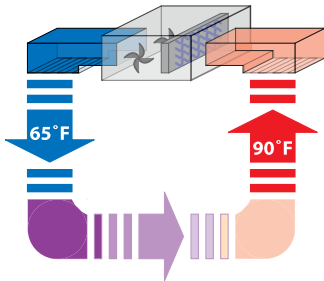
15,000 watts of heat needs two tons of air conditioning to remove. (See calculations in Appendix.) To put this into perspective, a two-ton air conditioner will cool a three-bedroom home to 72 degF in an Arizona summer.

Added to this calculation is the external temperature. Hot walls require air conditioning. A stand-alone building in a Michigan winter has different cooling requirements than a similar building in a Florida summer. To simplify our example, we will assume the outside temperature is 72 degF.

Since we only have about an hour before the equipment is damaged,
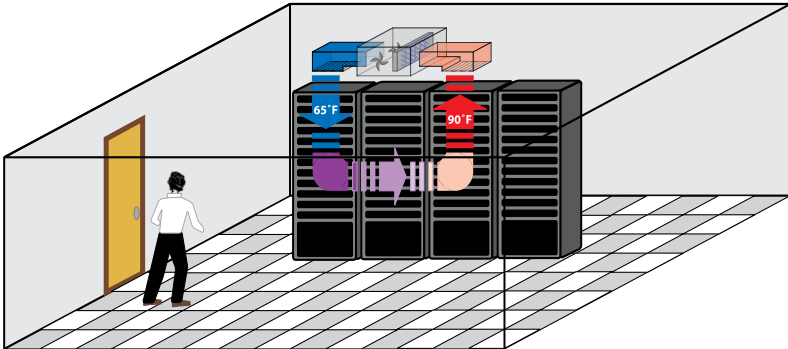
The air conditioner removes the room heat and the equipment heat. An air conditioner that is dedicated to the server room is preferred.

we need to instrument the air conditioner to get the earliest warning. A well-running air conditioner should have a 20 degF difference between the air inlet (suction) and the output (discharge) sides of the evaporator coil. If the filter begins to clog or the refrigerant starts to leak out, knowing the difference between these two temperatures may provide a week's notice that there is a problem. Having temperature graphs is important here.

We recommend measuring the temperature in four locations. The first location is at the wall thermostat, so we would know what the thermostat was seeing as it controlled the compressor and fan. A locked cover for the thermostat is highly recommended; one accidental brush of a cleaning person's vacuum hose is all it takes to turn off the air conditioner.

The next location is the hottest part of the server cabinet – between two "pizza-box" servers is a good start. One IT manager uses a hand-held infrared thermometer to find the hottest locations, then places sensors in those hot spots. The hottest locations will be the first temperatures to rise quickly if the cooling system fails.

The air conditioner should be instrumented in two ways. First, the inlet

A remote temperature sensor with mounting clips. Up to 16 of these can be used with a aggregate cable length of 600 feet.

temperature should be measured. A common way to do this to tie-wrap a Remote Temperature Sensor to the air inlet grill in the ceiling. In the same manner, attached a sensor to the air-conditioning output grill. The difference between these two reading reflects the efficiency of the unit. Some IT managers, particularly in the southern states, recommend monitoring the outside (ambient) temperature as well, in order to see what the building was subjected to.

Location	Purpose
Wall	Thermostat
Cabinet	Hottest
A/C	Inlet
A/C	Outlet
Outside	Ambient

Since the air conditioner is vital, experienced IT managers know that an emergency monitoring and repair plan is essential. First, place multiple personnel on the alert list. If somebody is on vacation – and someone is *always* on vacation or sick when alarms come in – the backup personnel will get the alarm.

Every IT manager who has lived through an air conditioning failure agrees that a service contract with an reliable A/C repair company with backup personnel must be established. The repair service must have 24 hour service. One IT manager even goes so far as to keep spare parts for his air-conditioning systems in-house.

Many IT managers recommend monthly reviews of temperature logs downloaded into a spreadsheet for analysis. Many things can happen during weekends and holidays, and the logs will show if the room has undergone a spike in temperature.

Monthly testing of temperature sensors – such as heating the them with a hair dryer to deliberately trip the alarm – is also highly recommended.

The logic behind all these recommendations is to get the earliest warning possible. High temperatures in the spaces between the pizza-box servers could indicate a problem; once the air around the wall thermostat or the A/C inlet gets hot, it may already be too late to save your equipment. Remote temperature sensors can have wire runs of hundreds of feet.

One well-placed temperature sensor can deliver an hour's early warning, enough time to get a repair technician on site.

How UPS Helps Cook the Gear

Ironically, a UPS unit can help fry your equipment. While a UPS can keep the server equipment running when main power fails, it doesn't keep the air conditioners going.
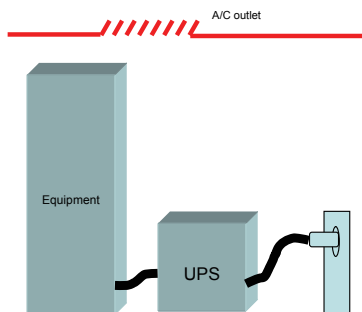
While keeping the equipment running during a power failure may make the users happy, it also means that the gear will keep making tons of heat. As we saw before, in as little as one or two hours the equipment could fry itself into scrap.

If main power fails for more than a few minutes, the safest thing for the server room equipment would be to shut each down until the air conditioning was restored. The servers should be gracefully shut down; programs exited, files closed, and the machines powered off. While an hour or two without service may frustrate your users, just imagine how much worse it will be if your system is off-line for days or weeks because you had to re-build the entire server room after the equipment cooks itself!

Hot Spots, Temperature Variations

When the thermostat on the wall reads 72 degF, the natural tendency of most people is to assume this means that the room is 72 degF everywhere. But of course, this simply isn't the case; temperatures can vary by 10 degrees or more in a room, and variations of 20 degF inside server cabinets are common.

One WeatherGoose user attempted to check the accuracy of his remote temperature sensors by arranging them on a eight foot long workbench located against one end of his server room, spaced equally apart across the bench. He discovered, to his surprise, that one end of the work bench was 8 degrees hotter than the other end! At first, the user suspected faulty sensors,

A combination temperature, humidity, and air flow sensor with mounting clip.

but by placing an industrial digital thermometer at each end of the bench, the user verified the temperature difference was real.

To minimize the "workbench" effect he tie-wrapped all six temperature sensors together so that they would all be reading temperatures in the same spot on the bench. Once tied together, all the temperature sensors read within half a degree F of each other.

Another IT manager, who built a 50' x 50' server room (large by our standards, small by data center standards), related her experience:

"We have hot spots in our data center. I can show you a 10' wall section 15 degF higher than the rest of the room. I'm putting in an additional air conditioning duct to hit that spot," she commented.

These experiences illustrate the importance of monitoring your server room's temperature with several sensors at multiple locations – otherwise, equipment on one side of the room might be running hot while equipment on the other side is well within normal limits, and you might never know until it's too late.

Using A City Power Monitor: Is the Power On?

Many users place a UPS between the city power source and their server equipment, so that the UPS serves as a power conditioner as well as providing backup power.

The downside of this configuration is that an off-site system administrator may not know his system is running on batteries until the batteries are exhausted and someone calls to ask why his e-mail is down. On top of that, the equipment will be running with no air conditioning, and we have already seen how much damage that could cause if the situation isn't dealt with promptly.

Or perhaps you're not actually losing power for long periods of time, but simply experiencing brief blackouts lasting a minute or less. (Faulty
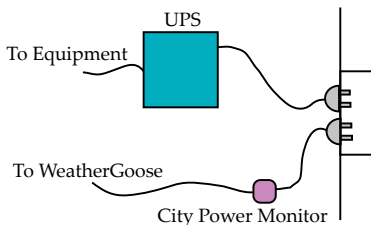
The City Power Monitor emits a 5 vdc signal when power is present. When power fails, an e-mail alarm is sent, which gains extra time.

breakers, bad wiring, unreliable power from your local substation – who knows?) If the building was unoccupied, who would know the power had ever gone out at all?

ITW offers a small accessory called the City Power Monitor for just these kinds of scenarios. Even if the power is only lost for as little as a second or two, the CPM will cause the WeatherGoose to log the event and send out an alert to the system administrator.

Backup Air Conditioners

From a peace-of-mind perspective, the most secure method of preventing a meltdown is to have a backup air-conditioning system that is completely separate from the primary system.

Whether a stand-alone portable unit or a duplicate in-ceiling machine, this is a practical way to keep equipment in operation while the primary air conditioner is being repaired.

One user reported he had installed a backup cooling system from a contractor built from used components for $5,000, including installation.

We mentioned this to a local IT manager and she said, "A back-up air-conditioning system, which I still don't have, is next on my budget list. By

the way, you're right about the UPS helping cook your gear. I hadn't thought about that until you mentioned it."

Graphing Key Elements

After watching dozens of server rooms, we came to the conclusion that any variable, such as temperature and humidity, tells a more valuable story with the information graphed. It's not the absolute value, however accurate,
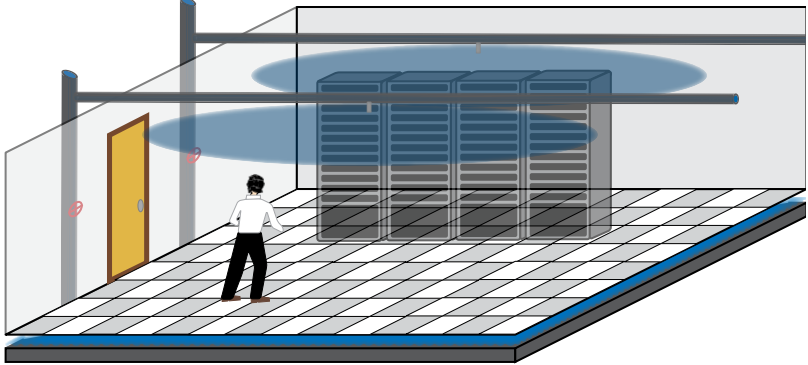
The circles show the range of the overhead sprinklers. Note the potential water sources in the wall and under the floor.

that matters most; it's the trends in those measurements that tell the story of what's happening in your server room.

## Water is Everywhere – Floor, Ceiling and the Walls

One IT manager we spoke to mentioned he had survived a fire-protection sprinkler accidental turn-on incident.   He tells about his experience with water:

"The sprinkler just turned itself on. Don't know why. A software guy walked in right as the sprinkler started spraying down on a line of five server cabinets. A maintenance guy found a big Styrofoam food cooler in a closet and climbed up on a chair to place it directly under the sprinkler head. He wrapped his sweater around the sprinkler head to help catch the water.

"It took ten minutes to figure out how to shut off the sprinkler water. Before they shut it down, three developers emptied the food chest eight times into trash cans. Could have been a disaster.

"We started counting water pipes around the server room. Water pipes were in the ceiling, the walls and under the raised floor.

"A slow flood could take a hour maybe but the sprinkler eruption would be catastrophic. What we needed was a permanent version of the Styrofoam
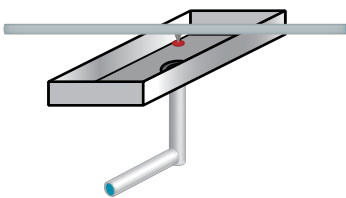
A 4' x 3' metal tray suspended over the server cabinets catches sprinkler water and drains it way. Low cost insurance against sprinkler or other water leak damage.

cooler to catch sprinkler leaks and other overhead leaks. The illustration shows the sheet metal tray we built to collect the ceiling water.

"The metal tray was simpler to build than we had imagined. A local air conditioning sheet metal shop made two trays with hangar brackets and ½" drains for less than $150. We punched pencil sized holes in the acoustic tile ceiling and hung the catch trays over the cabinets. The drain was a real problem. The maintenance guy for the building helped us route the garden house to a sink drain on the first floor."

Water Sensors

Most water sensors measure the difference between the conductivity

A water sensor turned upside down showing the metal water sensing brads.

of air and the conductivity of water. ITW water sensors have a low voltage applied to some metal brads on a plastic case.

When the water touches the brads, it completes the circuit and the current begins to flow. If the metal brads are touching a surface such as a concrete floor, the graphs will show a decrease from reading 99 (dry, no current flow) to 80 (damp) to 55 (full conductivity).

The water sensors plug into the C123C analog-sensor ports on Weather-Ducks and WeatherGeese. Up to three water sensors can be connected and monitored individually. More can be used by wiring multiple sensors in parallel; the only disadvantage of parallel-wired sensors is that you can't tell *which* sensor is wet, only that one of them is wet.
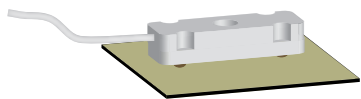
A water sensor mounted on a piece of vinyl for insulation. Note the metal water sensors are face down.

Make sure that the surface the sensor is placed upon is non-conductive. Since the sensor detects water by electrical conductivity between the metal brads, if those brads are in contact with a conductive surface – such as a metal tray – the sensor will *always* show full conductivity, wet *or* dry.

Installation rules for water sensors:

1. The sensor must face down – metal brads against the floor.

2. Placement locations:

    a. Water collection trays such as the trays below sprinklers. Don't forget to insulate the sensors with a piece of vinyl floor tile.

    b. Lowest point on the floor or below raised flooring. Find a lowest place on your floor. Spill some water and see where it puddles in your server room. That's a perfect place for a water sensor.

    c. Below a water pipe junction where the chances of a pipe leaking are good.

    d. In back-up air-conditioning condensation trays. If the primary tray's drain clogs up (very common because of algae growth) and the water flows into the back-up tray, once the back-up tray is full the next path for the water may be right onto your server cabinets.

3.   Place a heavy weight or clamp on the sensor so it cannot move. We have seen some sensor installations where the connecting wire had raised the sensor to 3" off the surface. The water would have had to reach 3" in depth before the sensor would signal the alarm.

4.   Test the sensor. Dunk it in a glass of water and see if you get an alarm. Wipe it off, then place it on a wet napkin and note the reading.

5.   Make sure the sensor is installed on an insulated surface. If the sensor must be placed on a metal surface, such as inside an air-conditioner's condensation tray, place a vinyl floor tile under the sensor, in between the sensor and the galvanized metal.

Routine testing of water sensors is essential. Unlike temperature, which can show revealing trends over time, water is likely to be an all-or-nothing event. Periodically dunking water sensors in a cup will confirm the sensors are operational.

Correct orientation of the sensors is also essential. We were looking at another installation in a data center. I asked the tour guide to see the water sensors, and he lifted a floor tile to show me a sensor he had installed near a floor drain point. The sensor had been installed upside down. Be sure the metal sensor brads are against the floor. Nylon tie-wraps are a good way to restrain a water sensor.

Testing the Alarms - Do They Work?

We asked customer if they had ever received alarms from their monitoring equipment.

"No," was the answer, "we have good infrastructure."

This is not a good answer. In a collection of two dozen sensors of mixed types, it is highly unlikely that you would *never* see a single out-of-bounds condition, even if it was just a false alarm. If you go for weeks at a time without a single alarm being raised, your alarm set-points may be set too generously, or your sensors may not be located in the best spots to give you early warning of potential problems.

Try setting you alarm limits closer to what you think the "normal" operating environment should be, and consider surveying your installation

A complete smoke alarm kit ready to go. Plug the cord into the wall and the control wires into the climate monitor.

with a hand-held infrared thermometer, to see if there are any hot spots you might be missing.

Smoke Alarms

Most buildings have existing smoke alarms. The problem is that when they sense smoke there may be no one around to hear it. That problem is solved with an ITW smoke alarm which interfaces directly to the climate monitors.

Many smoke alarms have a third wire that enables one smoke alarm to set off other alarms, such as in a hallway or long building. ITW uses this extra wire to relay an alarm to a WeatherGoose. The smoke alarm still operates in the normal mode, but now an e-mail or page can be sent in addition to the loud buzzer alarm.

Door Sensors

These tiny sensors, long used in the security industry, have two parts, a magnet and a magnetically-activated switch. If the magnet gets close enough to the switch, usually within a inch or less, the switch closes or opens, depending on which type you select.

These little switches can tell a door's position. They are the same kind used in building security systems.

These sensors offer a low-cost option to monitor whether the doors to the server room or equipment cabinets are opened or closed. Server and UPS cabinets are excellent candidates for this kind of monitoring, since under normal conditions no one should be opening those cabinets without the IT administrators' knowledge.

Depending on your server room's location and security requirements, you might also place sensors on any doorways allowing access to the room – although this option should be considered carefully; if personnel frequently come and go during the day, the steady stream of alarm mail will quickly become an irritant. However, such alarms can be valuable for weekend monitoring; if a door sensor goes off on a Sunday, when the building is supposedly unoccupied, something is wrong!

Note that door sensors will take some carpentry skill and various hand tools to install correctly.

Light Level

The WeatherGoose has an internal light-level sensor, which can show you at a glance if the room lights are on or off. Reading the graphs of the light conditions can show you when, or if, the room is occupied at various times of the day, or whether someone may have been working in that room over the weekend.

Some innovative users have run fiber-optic light pipes from alarm lights on the buildings' alarm-control panels into the WeatherGoose's light sensor,
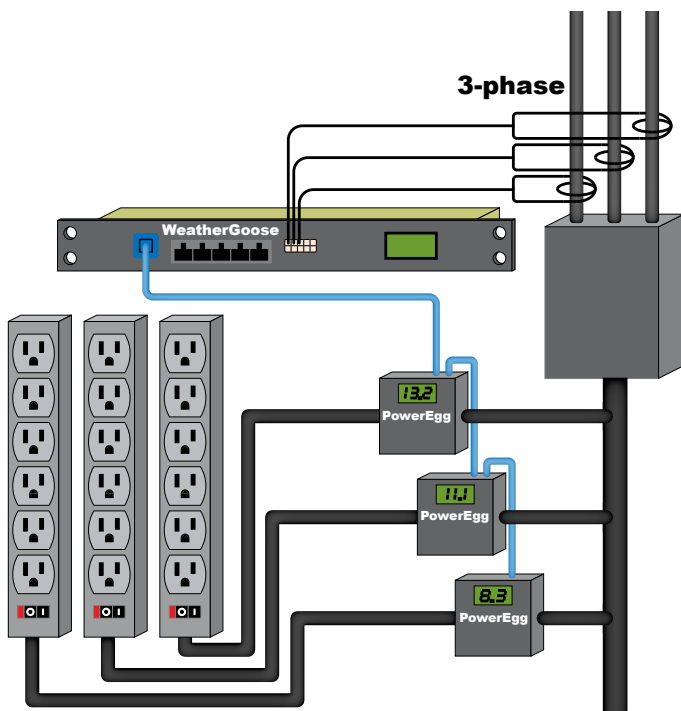
Three Current Transformers monitor the amperage in the three-phase power source. Three Power Eggs monitor the amps going to individual power strips. The WeatherGoose web-enables the data.

to make the WeatherGoose send them an e-mail alert if the building systems went into alarm state.

Sound

An internal microphone measures the sound levels every five seconds and stores the peak value. (It does *not* actually record the room sounds. It measures and remembers the highest audio peak values, sampling every five seconds. The purpose of the sound-level reading is to tell if any general change in the noise of the server room has occurred, such as fans shutting off, or audio alarms sounding, or personnel being in the room when they shouldn't be.

This function can be useful in many ways. Several users reported a substantial increase in sound levels when UPS units went into alarm mode and sounded an alarm horn, for example. Another user reported that you could detect bad bearings in cooling fans; the low frequency rumble of the failing bearings is easily seen as an increase in noise on the graphs.

Power - How to Keep the Juice On

The nightmare of power strips stems from the internal circuit breakers in the power strips. An electrician explained there are two types of circuit breakers in power strips, thermal and magnetic.

Current transformers clamp around a single power carrying wire and convert the current value into a 0 - 5 vdc signal suitable for the C123C port of a WeatherDuck or WeatherGoose. This model has swing-open jaws to clamp around an existing cable.

In most installations, web or e-mail servers are expected to turn-on and stay running. If the power consumed exceeds the limit of the circuit breaker, the entire computer system will be abruptly disabled. There is no advance warning for breaker tripping; one day the all the equipment plugged into the affected power strip goes off. The IT manager will wonder if the normal operating load (amps) was exceeded or the circuit breaker became defective.

Suppose a power strip is rated at 15 amps. If the strip uses a thermal breaker, and the total load on the power strip held steady at 16 amps, the thermal breaker would eventually trip and turn the entire strip off. But if the

A simple way to monitor existing power strips is to insert a PowerEgg 2 between the power source and an existing power strip. Both receptacles can be controlled via the Web.

strip uses a magnetic breaker, and a power surge (higher voltage) occurred which briefly raising the current above 15 amps, the faster-acting magnetic circuit breaker would trip even if the normal load of the equipment connected to the strip was considerably less.

Many IT managers create a policy to not exceed a power strip's rated capacity by 60%. A 20 amp power strip would be restricted to 12 amps. The hard part is learning how much current is going into the strip.

An electrician can measure the draw of each power strip by powering down the existing power strip and inserting a break-out box, or by using a hand-held clamp-on ammeter. But the usefulness of these measurements is usually short-lived, because equipment tends to migrate from cabinet to cabinet and new equipment is always being added. If the breaker trips, a trip to the server room is needed to reset the breakers, and the IT manager has to determine why the breakers tripped. Usually, this is not easy.

There are two ways to monitor current in existing power systems:
Current Transformers
In-line Current Meters

Current Transformers

A current transformer (CT) surrounds a single current-carrying wire and converts the current into a 0 - 5 VDC signal suitable for input to the Weather Duck or WeatherGoose C123C analog-sensor jacks. The CT supplied by ITW can be selected for 30, 60, or 120 amp scales with a slide switch.

The most common place to mount a CT is around one of the wires entering or leaving the breaker box. It cannot be used around power cords unless a single power conductor is extracted from the cable.

In-line Power Meters

A PowerEgg inserts between a power source, typically the wall power receptacles, and an existing power strip. Internal circuity measures amps, volts, and watts along with a number of other variables such as power factor. The units come with a number of power plugs and receptacles, with a maximum load of 20 amps.

A back-lit LCD continuously displays the current measurements, and an RJ-11 connector permits the unit to send its data to a WeatherDuck or WeatherGoose for logging and trend graphing. and alarming

Dual Power Strips

Many devices, such as Cisco routers, have A and B power inputs. If you haven't used equipment with two power inputs, the utility seems vague until you need to power down an entire power strip to add or remove equipment. With dual power-inputs, the equipment automatically operates off of whichever input is "hot", switching between them without interruption. If the equipment you plan to install in your server room is available with this feature, we highly recommend it.

PowerGoose

PowerGoose, a WeatherGoose with internal power measurement, is an excellent alternative to current transformers and PowerEggs since the power measurement capability and ten 15-amp receptacles are included in one convenient rack-mounted box.

Power Trends Seen in the Graphs

The ability to measure and graph will sometimes show some surprising variations in voltage changes. Normal line voltage in the U.S. is supposed
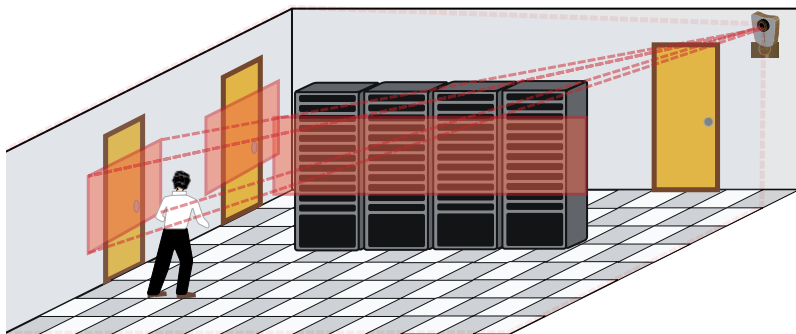
One low-cost web cam can monitor three zones in a server room. The threshold of detection can easily be adjusted. If the camera detected motion, and e-mail alert is generated.

to be 120VAC – and as long as the lights are on and everything is running, it rarely occurs to us that it might be anything else.

But when you monitor and graph your power over a period of days, you just might be surprised at what you find! One customer discovered, after installing his PowerEggs, that his incoming line voltage sagged at least twice a week to about 100 volts – almost brown-out condition. Once again, graphs tell the story.

The Cisco installer technicians we spoke to said their gear starts shutting down automatically about 105 volts. They recommend running all critical gear off the UPS units, which are far more forgiving of voltage changes and produce a steady voltage output.

We recommend all server room power be on dedicated circuits; that is, the wires should run from the power transformer on the power pole outside the building directly to the computer equipment inside, and the sever room should have its own breaker box independent from the rest of the building circuits. Many facility managers oppose this due to the expense, but the benefits can easily outweigh the additional expense.

Otherwise, your server room and all of your valuable data could be at the mercy of anyone who might plug in a copy machine, a floor polisher, or even an arc-welder without realizing the wall socket they used is on the same circuit as the server room.

Video Cameras

The features of low-cost video cameras are remarkable. We recommend every server room use a video camera. The addition of a video image to server room monitoring gives an added dimension. If an alarm is sent, a quick look at a Web Browser tells you if the lights are on and who is in the room, something you would only have found about by driving over to the room.

The D-Link 950. Excellent still and motion pictures plus motion detections with e-mail alarms. The threshold of detection can easily be adjusted.

We recommend and support the D-Link DCS-950. The camera produces superb pictures, and is supported by the ITW climate monitor and Console software.

The D-Link camera also offers motion detection with e-mail alerts, making it very useful; if something moves, you'll soon know what or who it was.

Once installed, you can get an e-mail if the camera detects motion in the server room. The DCS-950 can detect motion in any of three present fields. This feature was previously available only in cameras costing over a thousand dollars.

The cost of one trip to visit a remote server room is well worth the price of these cameras.

The Well-Monitored Server Room

Whether you have two server rooms to manage, or two hundred, it's nice knowing you have a good chance coming out of a climate failure with minimum damage. Remember to test the sensors.
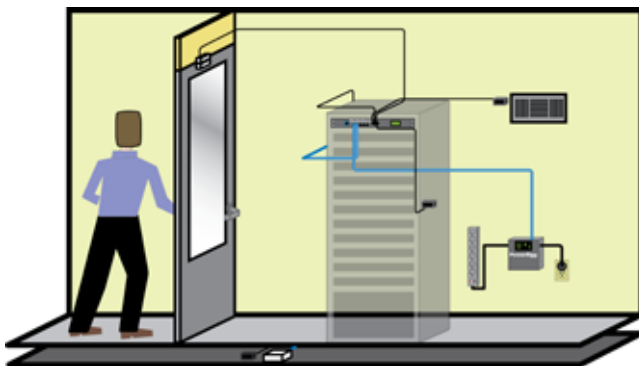
A fully-monitored server room. Temperature, humidity, air flow, doors and power are monitored. The video camera is not shown.

Written by the staff of IT WatchDogs, who have helped users install thousands of WeatherGoose and SuperGoose server room monitors.
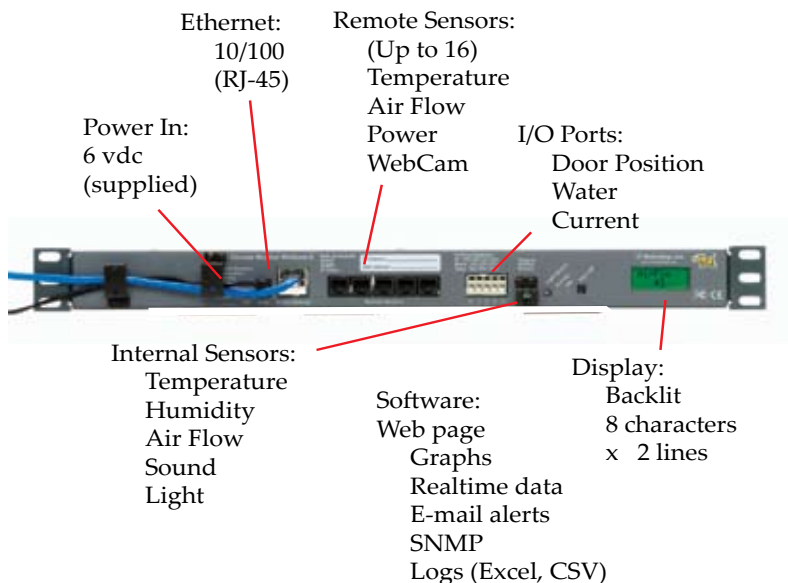
Climate Monitors

WeatherGoose

SuperGoose

MiniGoose

PowerGoose

*WeatherDuck*

WeatherGoose Family Features and Connections

The drawing below shows the major parts of a SuperGoose. The device operates stand-alone without a subscription service or an intermediate server. The user needs only a Web Browser to view the data.

Ethernet:
10/100
(RJ-45)

Remote Sensors:
(Up to 16)
Temperature
Air Flow
Power
WebCam

Power In:
6 vdc
(supplied)

I/O Ports:
Door Position
Water
Current

Internal Sensors:
Temperature
Humidity
Air Flow
Sound
Light

Software:
Web page
Graphs
Realtime data
E-mail alerts
SNMP
Logs (Excel, CSV)

Display:
Backlit
8 characters
x   2 lines

All of the Goose family uses the same firmware which is described in the software section. Alerts, graphing, logs, and a variety of other functions are common throughout the product family.

All Goose models come with two remote input channels, except the MiniGoose which only has one channel, and these are described in the "External Sensors" section later in this chapter.

Six Products, One Software & Hardware Base
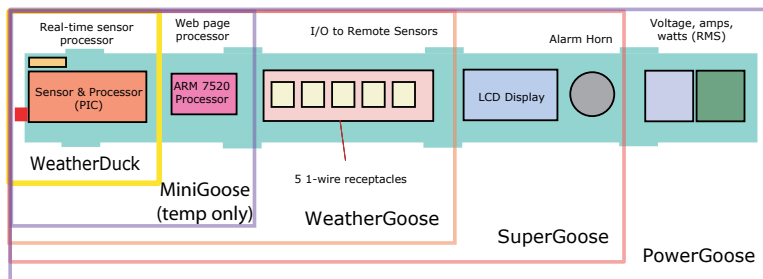
A common hardware and software base supports the Goose family.
This allows high code stability and a wide range of features.

MiniGoose

The smallest, lowest-cost Goose, the MiniGoose contains an internal temperature sensor and a connector for up to 16 remote sensors. The Mini has full Goose firmware and video camera support

WeatherGoose

Contains full set of internal sensors, three I/O ports, and five jacks for

remote sensors. Full Goose firmware.

SuperGoose

Same as WeatherGoose with added alarm horn and local, back-lit LCD display. Front panel has horn-silence button.

PowerGoose (shown front and back)

Same as WeatherGoose but adds voltage, current, and power factor measurement and ten 15 amp receptacles. Full Goose firmware and video support.

WeatherDuck

ITW's first product. This tiny climate monitor attaches to a server's serial port and contains a full set of internal sensors. Client software (supplied on a CD), creates a web page, graphs and alarms. C123C ports and the serial sensor bus are supplied. Power is supplied from the serial port.

Video Cameras

Every ITW web-based climate monitor has provision for video images on the web site. These are IP Ethernet-blased cameras. The user loads the IP

address of the camera into the Weather Goose and an image is extracted and published on the Goose' website.

An important consideration is the use of JPEG images. When a WeatherGoose polls a camera the image extracted is a JPEG, not a proprietary image requiring client software to display. This format reduces chances of fire walls blocking the images and insures fast loading times.

The D-Link 950 supports an e-mail alarm upon motion detection—a very useful feature for server room monitoring.

Only two cameras are supported: the one above and the Axis 205.
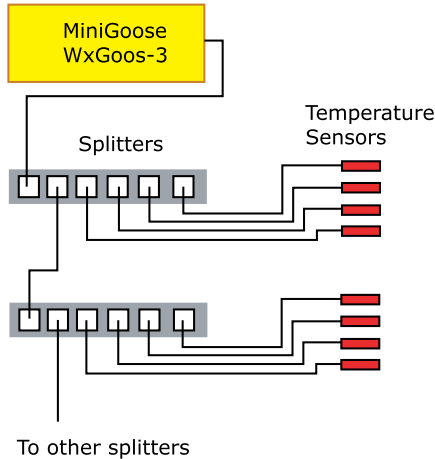
External Data - the Serial Bus

There are two ways to access external sensors: the serial bus and the I/O ports.

The serial data bus supports 16 devices and uses Cat3 wire. There are five RJ-11 receptacles in the rack mounted Geese and the MiniGoose has one. Through the use of a telephone-type splitter, the sensors can be expanded to sixteen. Users can use telephone splitters, wire nuts, or punch-down blocks to add sensors. The sensors communicate using the Dallas Semiconductor "1-wire" serial communications protocol.

Typical sensors attached to this port include temperature, humidity, air flow and power devices (PowerEgg).

The serial bus is a low speed channel and generally forgiving of wiring methods, but hub wiring is preferred to star. Each device attached to this channel has a unique 64 bit address laser etched in the unit to eliminate the need to stick paper tags on the remote sensors in order to identify them or set address switches.

Users should note that in wiring the serial bus devices to avoid "cross-over" type connects since the remote sensors are polarized.

I/O Ports (C123C)

These three ports accept 0 to 5 VDC inputs. A built-in loop current source permits use of contact sensors such as door position sensors.

Weathergoose

WxGoos-1: a simple, low-cost device for monitoring cabinets and racks, the unit contains five built-in environment sensors, door sensors and a serial bus port for a variety of external sensors.

WeatherGoose - Individual or Multiple Cabinet Monitoring

The compact unit installs in a 1U rack space or inside the cabinet. The unit can also be secured with self-tapping screws through the small tabs.

A simple, low-cost device for monitoring cabinets and racks, the WxGoos-1 contains five built-in environment sensors, door sensors and a serial bus port to for a variety of external sensors.

Internal Sensors	External Sensors
Air Flow	Air Flow
Humidity	Door Position
Light Level	Humidity
Sound Level	Power
Temperature	Temperature
	Water

The unit can be used stand-alone on a per-cabinet basis or easily expanded to monitor room conditions or the conditions in nearby cabinets.

General features:
▪ Five internal sensors
▪ Multiple remote sensors
▪ Built-in receptacles for remote sensors
▪ Ethernet port, Internet accessed.
▪ Multiple mounting methods
▪ No hub or Master controller needed
▪ Price: $399, single unit quantity

External sensors and be added while the unit is in operation. No switches or hardware adjustments are necessary.

This architecture permits one WxGoos-1 to monitor multiple cabinets through remote sensors. All the sensors are internal (external magnetic-type door sensors are required to sense door position).

Self-contained Operation

Each WxGoos-1 is self-contained and does not require a master controller or "mothership." The internal computer collects the data and compiles the information into a web page and other protocols. The user needs only an

In-Cabinet Mounting

Mounts in 19" rack

Internal Sensors:
Temperature
Humidity
Air Flow
Light Level
Sound Level
Door Position
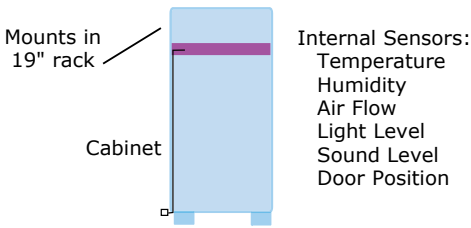
Cabinet

The device typically mounts in the top portion of the cabinet. It can be mounted vertically or horizontally. The top position exposes the device to the air exiting the cabinet.

Internet browser. Administration of the unit is through a Web browser or Telnet session. Access is user name and password protected. SSL security is implemented.

The WxGoos-1 uses a small, UL-listed wall transformer for power.

A variety of software is supplied so the data can be presented though a Web page, Excel® spreadsheets, Telnet, and Simple Network Monitoring Protocol (SNMP). When viewed through the Web format, a variety of graphs can be viewed.

Alarming functions via SMTP e-mail and paging are available and thresholds easily set. Multiple addresses and alarm threshold levels can be set.

Using Remote Sensors
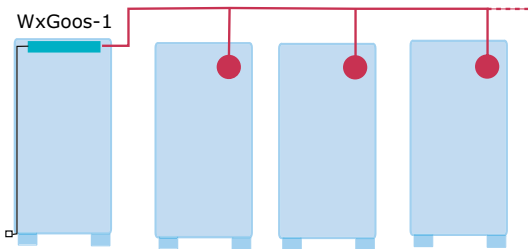
WxGoos-1

In this drawing, one WxGoos-1 monitors the temperature and airflow in three adjacent cabinets. Each sensor plugs directly into the unit. The sensors do not require power. Sixteen remote sensors can be added hundreds of feet away.

Stand-alone or Console-monitored

The built-in Ethernet port makes the WxGoos effective both in single cabinet monitoring or in multiple cabinet installations for three reasons:

First, the user needs only an Internet connection to access the data from anywhere. Second, The unit can be part of a local sub-net operating beind a firewall which utilizes existing security infrastructure. VPN's or private networks can be used.

Third, the availability of SNMP based data allows dozens of Network Monitoring programs such as HP OpenView, IP Sentry, MRTG, or What's Up Gold (Ipswitch) to easily add the WxGoos to the list of monitored devices.

The SNMP MIB supplied automatically expands as remote devices are added making integration straightforward.

Remote Sensors

The remote sensor serial bus was designed to make the cost of adding remote sensors or other remote devices minimal.
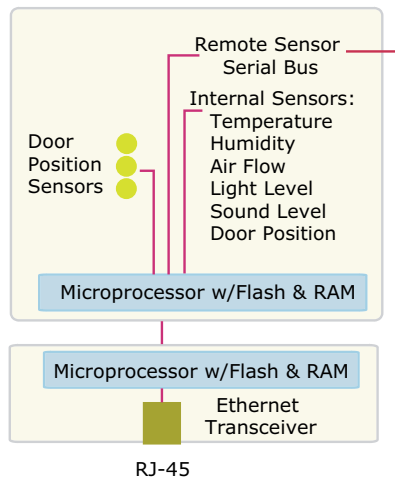
The Dallas Semiconductor 1-Wire protocol uses telephone wire or Cat3 cable. RJ-ll connectors are used. Lengths of up to 1,000' can be achieved in straight runs. Star topology reduces the aggregate length of the serial cable, but runs of hundreds of feet are common. All remote sensor devices are parasitically powered, so no remote device power supplies are required. Remote devices can be added or deleted without reconfiguration.

Simple Installation

The narrow flanged sheet metal housing gives the installer the most flexibility in attaching the unit. In existing cabinets the unit can be simply tie-wrapped or secured with self-tapping screws to the cabinet's top grill or internal rail.

In new installations, a bracket secures the device to an vacant location. Upon start-up, the installer uses an automatic discovery program that assigns the desired IP address. If a subnet is operational, the WxGoos' internal DHCP software will automatically lease an address from the server.

One microprocessor controls the data acquisition and conversion tasks. Another is devoted to Ethernet communication and signalling protocols. Firmware to either processor can be downloaded in the field.

Remote Sensor Serial Bus

Internal Sensors:
Temperature
Humidity
Air Flow
Light Level
Sound Level
Door Position

Door Position Sensors

Microprocessor w/Flash & RAM

Microprocessor w/Flash & RAM

Ethernet Transceiver

RJ-45

Specifications:

Internal Sensors
Temperature: -67F to 175F, +/-0.5oC
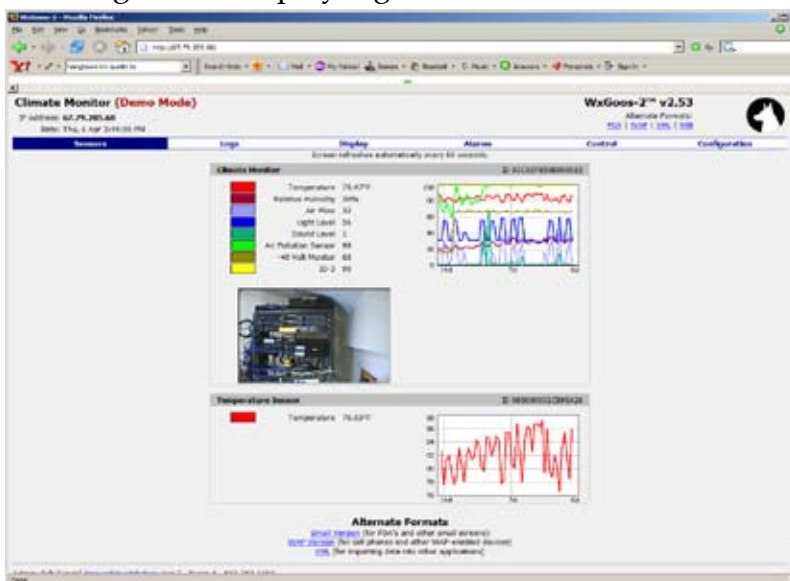Humidity: 0 -100% +/- 5%,
Air Flow: 0 - 150cfm, +/- 25%
Sound Level: 0 - 200dbm, +/- 10%
Light Level: 0 - 100 Lux, +/- 5%
I/O Ports: Three, 0 - 5 vdc analog sense (or output) with controllable loop current
Remote Serial Bus: 1-Wire protocol, self-powered. Typical distances of 600' aggregate length.

Web Page Data DisplayPage

The picture shows a typical web presentation of a cabinet. Both real-time data and a history (in this case six days) can be seen. When new remote sensors are detected , they are added automatically to the web page display.

Remote Sensors.

Receptacles: RJ-11, eight provided.
Temperature: -67F to 175F, +/-0.5oC
Air Flow: 0 - 150cfm, +/- 25%
Water Detect: 0 - 100, +/-30%
Door Position: magnetic switch
Current Transformers: 30, 60, 120, 300 amperes, ac, switch selectable.
Power Condition (PowerEgg2):
    Volts: 80 - 280 vac, auto sensing
    Receptacles: two controllable, 10 amps each
    Amps: 1 - 30
    Watts: 1 - 8,400
    Power Factor: 0 - 99%
    Peak volts, low volts
    Volt amps (instantaneous)
    Accumulated kWh. 0 - 64,000 kWh.
Power: 9vdc, 300ma.
Connector. RJ-45 female connector.
Ethernet: 10/100bps, auto select.
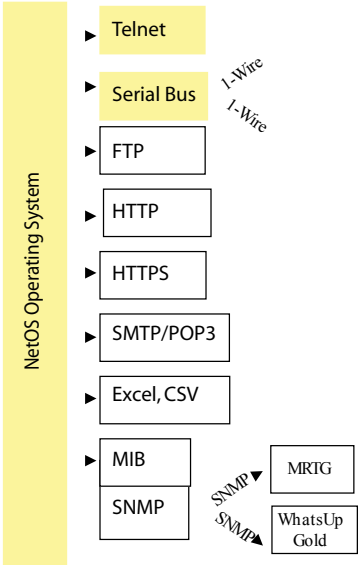Memory: 8MB RAM, 2MB Flash.
Mounting: Four 1/4" mounting tabs.
Housing: 18 ga. aluminum, powder coated, medium gray.
Size: 2.3" W x 8.5"H x 1.2"
Indicator Lamps: Power, link, and data.

From the user's perspective, the data is presented in a number of popular standards. The casual user browses to check cabinet condition while the system developer has a number of tools to speed integration.

NetOS Operating System

- Telnet
- Serial Bus — 1-Wire, 1-Wire
- FTP
- HTTP
- HTTPS
- SMTP/POP3
- Excel, CSV
- MIB / SNMP — SNMP → MRTG, SNMP → WhatsUp Gold

User Software

In the most basic application, the cabinet end-user is presented with an IP address on a paper sticker or tag. The user connects a laptop to the cabinet's Ethernet jack, types in the IP address and a Web page is displayed.

If the user desires to change the IP address, a Configuration tab is displayed.

Data and Communication Protocols

The data created by the WxGoos can be presented to the user in a number of ways:

HTML	XML
Telnet	Excel
CSV	

The most common presentation is Web page creation, but the other protocols offer the OEM or custom software developer a number tools to offer flexibility. Web pages are updated every five seconds or when the user requests a page refresh.

The following communication and data protocols are supported:

TCP/IP	DHCP	UDP	SNMP
SSL/TLS	HTTP	HTTPS	Static IP

Firmware, both in the data acqusition microprocessor and the communications processor, is field-upgradable. Bug fixes and upgrades can be easily downloaded.

Console Software

The Console application allows monitoring of hundreds of WxGoos units. Real-time data and graphs is displayed plus version and release number of both the hardware and software.

Using SNMP for Console Integration

Many Network monitoring console products such as HP Openview[tm,] What's Up Gold[tm] (Ipswitch), IP Sentry[tm], and many others require the data be presented in a SNMP MIB format. The WxGoos-1 is internally SNMP-enabled with the internal sensor data plus the external sensor data represented in the MIB. The MIB is automatically expanded to display the data of external sensors as they are added.

Traps can be enabled for each each sensor and the sensor's MIB variable is included in the trap message. If a remote sensor is unplugged, all alarms on that sensor are considered "tripped." Therefore if you unplug a device with 3 sensors where all sensors are alarmed, three separate traps will be created. There are four trap addresses available

All sensors on all devices are eligible for being trapped. Each sensor can have a different alarm setting that is one of:
- ▪ Disabled (no alarm)
- ▪ E-mail
- ▪ Trap
- ▪ Both E-mail and Trap

Abbreviated MIB Contents

The following text displays the typical MIB contents; the data has been edited for space considerations. The most current MIB can be downloaded from any WeatherGoose Monitor.

```
T-WATCHDOGS-MIB DEFINITIONS
DisplayString, TruthValue
                FROM SNMPv2-TC
MODULE-IDENTITY, OBJECT-TYPE, enterprises, Unsigned32
                FROM SNMPv2-SMI;
itwatchdogs MODULE-IDENTITY
        LAST-UPDATED "200312170000Z"
        ORGANIZATION "I.T. Watchdogs MIB Subtree"
        CONTACT-INFO "support@itwatchdogs.com"
         "The MIB for I.T. Watchdogs Products"
        ::= { enterprises 17373 }
wxGoos OBJECT IDENTIFIER
        ::= { itwatchdogs 2 }
deviceInfo OBJECT IDENTIFIER
        ::= { wxGoos 1 }
productTitle OBJECT-TYPE
        "Product name"
        ::= { deviceInfo 1 }
productVersion OBJECT-TYPE
        "Product version"
        ::= { deviceInfo 2 }
productFriendlyName OBJECT-TYPE
        "User-assigned name"
        ::= { deviceInfo 3 }
productMacAddress OBJECT-TYPE
```

Alarms Set Through Web

Whether on a subnet or an open network IP address, the user can access hundreds of WxGoos units. The IP addresses can be leased from a DHCP server or assigned as permanent static IP addresses. Reconfiguration and field software upgrading can be done remotely.

External Sensors are Automatically Discovered

Each time an external sensor is added or disconnected, the list is automatically updated. Each device contains a factory-set 64 bit address which can have a friendly name attached.

Multiple Sites

113.23.34.56

124.3.3.5

125.3.3.6

Monitoring
Console

Internet

Each site has a static
or dynamic IP address

Multiple Cabinets

MultipleCabs101103
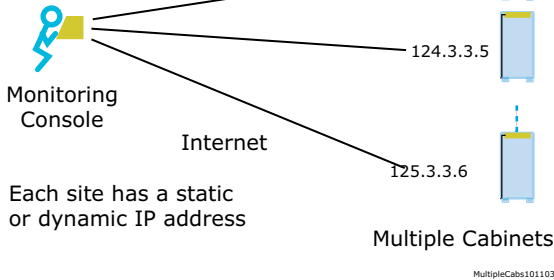
*Console uses IP addresses and passwords for monitoring. No SNMP
knowledge is required. Console can be installed on a remote server or
a local PC.*

Console: Graphing and Multiple Site Monitoring
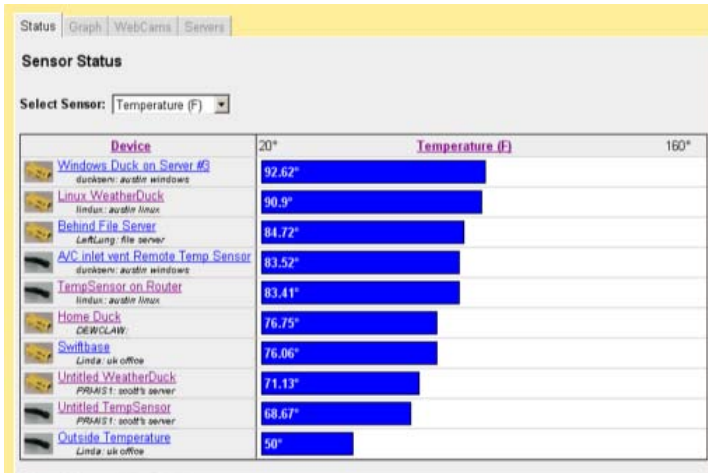
*The WatchDog console provides an easy way to keep watch
on multiple server rooms. Graphs are consolidated - any
room with a soaring temperature is quickly seen. If video
cameras are used the a page consolidates the web pictures.*

Using External Sensors
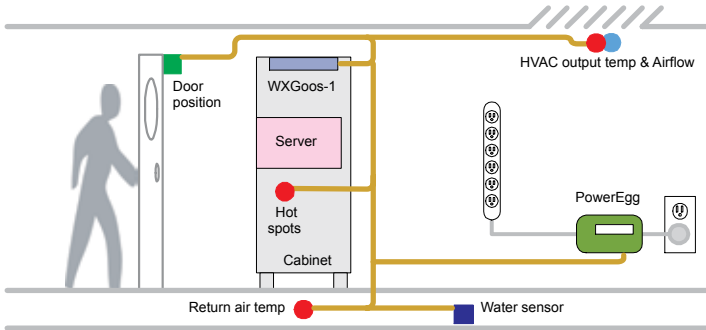
With one WeatherGoose and a hand full of low-cost sensors, the server room can be completely instrumented and monitored.

SuperGoose

A low-cost, rack-mounted environment and access monitor for racks, cabinets and server rooms featuring an LCD display, a warning horn, and a full set of internal sensors.

SuperGoose WxGoos-2

The compact Climate Monitor occupies a 1-U space and contains a complete set of internal sensors. The optional web cam is remotely mounted. A variety of remote sensors are easily added.

This self-contained unit continually monitors climate conditions and displays them via an internally-generated web page. Values are locally shown on a built-in display. The values are continuously graphed for easily seen trends.

When user-defined thresholds are exceeded, alarms can be sent via e-mail, audio alarm, or SNMP trap. The alarm can be silenced locally. No client software is required.

The simple sheet metal front panel allows ample space for logo and other brand information with color matching.

A web page displays the current values with graphs showing trends. The web cam image is JPEG format. The data can be viewed on a PDA and cell phone. The unit is configured via the web page. The web page can be quickly configured for specific logos and brand names.

All connections are made through the front panel. No client software or installation CD is required. The user connects an Ethernet cable, sets the IP address and begins using the unit. An LCD constantly displays the sensor values.

A full set of sensors is included inside the unit:
▪ Temperature
▪ Humidity
▪ Air Flow
▪ Light
▪ Sound
▪ Door Position
▪ Web Cam (external)

A variety of remote sensors are easily added. Up to 16 remote sensors can be added using Category 3 telephone wire and RJ-11 connectors. Remote sensors include:
▪ Temperature
▪ Air Flow/Temperature
▪ Water
▪ Current (ac amps)
▪ Power (volts, amps, watts)
▪ Motion

Remote sensors allows the unit to monitor up to 16 cabinets hundreds of feet distant or show the status of air-conditioning outputs. There are five remote sensor jacks on the unit. Simple splitters expand to use all 16 sensors.

Software protocols include:
▪ Web (HTTP)
▪ SMTP/POP
▪ SNMP (full MIB)
▪ FTP (firmware upgrades)
▪ Graphing
▪ PDA display format
▪ WAP (cell phone display)
▪ XML
▪ Excel™

Real-time values are continually displayed on a 2 line by 8 character backlit LCD display for local viewing.

The web cam used is an IP-based Axis 205; it can be installed locally or remotely.

Firmware updates can be made by FTP file transfer which eliminates returning the unit to the factory. All jacks are front panel mounted. Remote sensors can be located hundreds of feet away. The unit is powered by a 6vdc wall transformer (included).

A version 2 SuperGoose with the adjustable mounting brackets and the optional D-Link 950 web cam which integrates with the Weather-Goose, MiniGoose and SuperGoose..

MiniGoose WxGoos-3

A bare-bones version of the WeatherGoose, this small monitor fits where space or budgets are tight. Available with an optional video camera.

MiniGoose WxGoos-3

About the size of a candy bar, the MiniGoose contains an internal temperature sensor and a serial bus that supports up to 16 remote sensors. MiniGoose incorporates the same alert and monitoring functions as the WeatherGoose. The Ethernet connection is shown.

Do you need a lot of remote climate sensors? Are you short on cabinet space? This tiny monitor has web access, graphing, and e-mail alarm alerts. Supports up to 16 remote sensors plus an internal temperature sensor*.

MiniGoose contains the same web engine as WeatherGoose climate monitors but relies on external sensors instead of internal sensors to reduce size. An optional web camera shows a view of the monitored cabinets.

Internal Sensor
Temperature: -20C to 50C (-4F to 122F), +/-0.5C*

Video Camera
Axis 205, 206 or equivalent (optional)

External Sensors (16, ordered separately)
Temperature
Air Flow and Temperature
Humidity, Temperature and Air Flow
Power Monitors: PowerEgg 1 and 2
CCAT Universal I/O Interface Sensors:
    Door position sensors
    Current transformers
    Water sensors
    City power monitor
    Any 0 to 5vdc output device

The internal temperature sensor is heated by internal circuitry. Depending on room airflow, the sensor will consistently read from 2 to 7 degrees F above ambient. Users should note this difference in observing temperatures and graphs. Remote sensors are the primary means of temperature measurement in the MiniGoose and are immune to internal circuit heating.

Up to 16 Remote Sensors
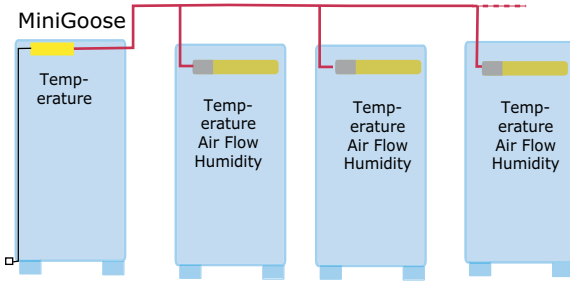
A single MiniGoose can monitor up to 16 individual cabinets and supports one video camera. A variety of remote sensors can be used, such as door position, temperature, humidity, and air flow.

Specifications

Physical:	4"L x 1.5"H x 1.5"W, 0.5 pounds
Power:	6vdc (wall transformer supplied), 2.1mm
Ethernet:	10/100 autosense, RJ-45 receptacle
Standards:	FCC Part 15, CE

Software Features

HTTP - web access

Alarms - high, low, unplugged
Graphs - all sensor values are graphed
SMTP/POP3 - e-mail alerts, POP password
SNMP - MIB with Gets, Traps and Clears
Paging - e-mail to pager proxy
XML - all values exposed and meta-tagged
Logging - Excel logs created, time set
PDA - Personal Digital Assistant format
WAP - Cell phone display format
Console - multiple MiniGoose viewer optional

Installation

The MiniGoose can be screw-mounted using the 0.125" mounting holes or tie-wrapped to a cabinet rail.

Model Number: WxGoos-3

MiniGoose case nameplate

MiniGoose
WxGoos-3

Splitters

Temperature
Sensors

To other splitters
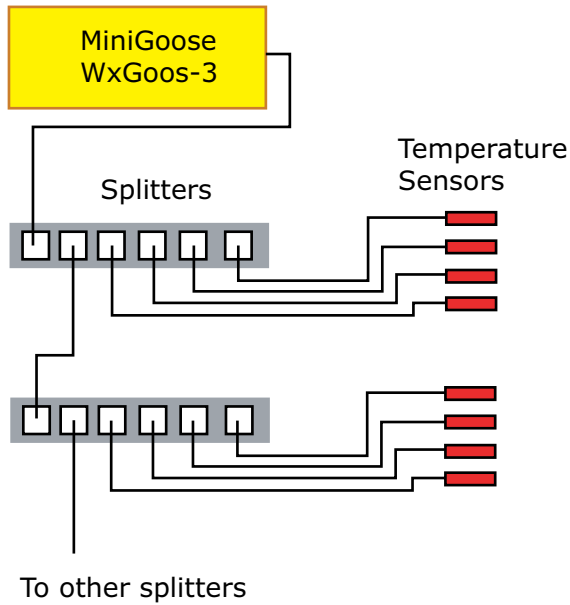
External sensors connect to the MiniGoose using Cat 3 telephone cable and RJ-11 connectors and a splitter. The aggregate cable length should not exceed 600'.

PowerGoose

Continually monitors climate conditions and displays them via an internally-generated web page. Values are locally shown on a built-in display. The values are continuously graphed for easily seen trends.

PowerGoose Climate & Power Monitor

This self-contained unit continually monitors climate and power conditions and displays them via an internally-generated web page. Values are locally shown on a built-in LCD display. The values are continuously graphed for easily seen trends. All connections are made through the front panel, and no client software or installation CD is required. The user connects an Ethernet cable, sets the IP address and begins using the unit. An LCD constantly displays the sensor values.

PowerGoose is a low-cost, rack-mounted environment and access monitor for racks, cabinets and server rooms. Full set of internal sensors, LCD display, warning horn.

Power and Climate Monitoring

When user-defined thresholds are exceeded, alarms can be sent via e-mail, audio alarm, or SNMP trap. The alarm can be silenced locally.

The simple sheet metal front panel allows ample space for logo and other brand information with color matching.

A full set of sensors is included inside the unit:
- Temperature
- Humidity
- Air Flow
- Light
- Sound
- Door Position
- Web Cam (external)

A variety of remote sensors are easily added. Up to 16 remote sensors can be added using Category 3 telephone wire and RJ-11 connectors. Remote sensors include:
- Temperature
- Air Flow/Temperature
- Water
- Current (ac amps)
- Power (volts, amps, watts)
- Motion

Remote sensors allow the unit to monitor up to 16 cabinets hundreds of feet distant or show the status of air-conditioning outputs. There are five remote sensor jacks on the unit. Simple splitters expand to use all 16 sensors.

Software protocols include:
- Web (HTTP)
- SMTP/POP
- SNMP (full MIB)
- FTP (firmware upgrades)
- Graphing
- PDA display format
- WAP (cell phone display)
- XML
- Excel tm

Real-time values are continually displayed on a 2 line by 8 character backlit LCD display for local viewing.

The web cam used is an IP-based Axis 205; it can be installed locally or remotely.

Firmware updates can be made by FTP file transfer which eliminates returning the unit to the factory.

All jacks are front panel mounted. Remote sensors can be located hundreds of feet away. The unit is powered by a 6vdc wall transformer (included).

The compact Climate Monitor occupies a 1-U space and contains a complete set of internal sensors. The optional web cam is remotely mounted. A variety of remote sensors are easily added.

A web page displays the current values with graphs showing trends. The web cam image is JPEG format. The data can be viewed on a PDA and cell phone. The unit is configured via the web page. The web page can be quickly configured to specific logos and brand names.

All connections are made through the front panel. No client software or installation CD is required. The user connects an Ethernet cable, sets the IP address and begins using the unit.

Weatherduck

A simple and low-cost remote monitoring device that plugs directly into a PC serial port and reports temperature, humidity, light level, air flow, and door position status for computer rooms and cabinets.

Remote PC Environment Monitor

A simple and low-cost way to monitor remote computer rooms or cabinets, the WeatherDuck plugs directly into the PC serial port and reports temperature, humidity, light level, air flow and the door position status. Remote sensors and a camera can be added.

The WeatherDuck unit plugs into a PC serial port. No external power supply is required. External devices may be added, such as remote temperature sensors and power condition monitors.

All sensors are internal (external magnetic-type door sensors are required to sense door position).

The WeatherDuck uses serial port power: no external "wall-wart" supply is required. The matchbox-sized device can be located up to 15' away by use of a serial port extender cable.

The PowerEgg accessory continuously monitors volts, amps, power factor, wattage plus low and high volts. Additionally, the amount of power consumed (kWh) is continuously calculated in the PowerEgg which can be used for sub-net power billing.

Comprehensive Software Supplied

Data can be viewed via a Web page, Excel® spreadsheets, Telnet, and Simple Network Monitoring Protocol (SNMP). When viewed through the Web format, a variety of graphs and real-time data can be viewed.

Alarming functions via e-mail and paging are available and threshold easily set. See the sections on software later in this data sheet.

Uses Existing IP Address

The WeatherDuck uses the existing server IP address and network connections thus saving the cost of maintaining a separate IP address.

The simplest application uses one WeatherDuck per room. Most users add a Remote Temperature monitor air conditioning register output or room temperature.

Avoiding Melt Downs

Remote computer installations face catastrophic failure in the event of air-conditioning failure. Once internal temperatures have exceeded 130 degrees F, the equipment is usually damaged and should be replaced.

Sensor Specifications

Each sensor is factory calibrated and should never require re-calibration. The WeatherDuck is an indoor device and can not be used in environments where condensation could occur. The presence of water on the circuit board will damage the electronic components.

Temperature:

-10C to +85C (14F to 160F), +/- 0.5 degrees. (Note: Remote temperature sensors share characteristics, and readings are updated internally every two minutes.)

Humidity:

0 -100% range, non-condensing, +/- 5%, 0-60 RH, +/- 8% at 90% RH typical.

Light Level:

0 -100 Lux, +/- 5%

Air Flow:

0 - 100cfm. (Updated every two minutes. 100cfm is the about amount of air from a 5" muffin fan in a no-resistance environment. A reading of 10 approximates still air, a reading of 100cfm is approximately 30.

Lamps:

Two internal green lamps (LEDs) are furnished and can be turned on and off under software control.

External Devices Bus:

A Dallas Semiconductor "1-Wire" bidirectional communication bus is furnished. All external devices (except contact sense) are sent over this bus. See serial communications for more information.

Input/Output Contacts (Door Sensors):

0 to 5 vdc with internal loop current furnished.
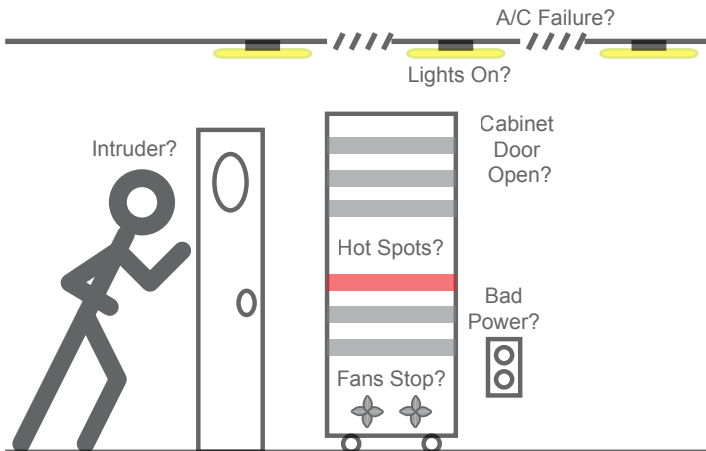
Adding a WeatherDuck provides a complete climate picture: magnetic door sensors allow the positions of room and cabinet doors to be monitored, and a WebCam provides a view of the server room.

Three multiple purpose contacts are supplied with screwdriver attachments. An internal 500 microamp loop current allows the position of magnetic door sensors to be detected. A reading of "1" means there is essentially no current (door open) and a reading of "99" means the full loop current is flowing (door closed). These sense ports can also be used to measure 0 to 5 volts direct current.

A 1.5 volt battery connected negative end to the Contact labeled "C" and the positive end to any of the contacts labeled "1,2,3" would give of a real-time reading of about "30" on the real time data (0 to 100) and graphing scale. It is this function that enables the monitoring of Current Transformers (CT) by use of a small adaptor.

Other 5 volt output devices can be used.

By use of a serial port command, the contact ports can be configured to output from 0 to 5 volts direct current. A typical application would be to turn a small lamp on (Light emitting diode typical. With an interposing relay, an auxiliary air conditioner or other high current device could be turned on. (Call Tech Support for more information on device control.)

Power Required:
None, uses power from serial port data lines (RTS and DTR) held to on by WeatherDuck software.

Connector:
DB-9, female connector

Mounting:
Two 4-40 screws with knobs

Data Input Connectors:
up to 24 AWG wire, solid wire preferred.

External Device Port:
RJ-11 female telephone connector

A rugged metal housing contains the circuitry and sensors.

Humidity Sensor

Accessory Device Connector

Lamps

Serial Connector

Temperature and Air Flow Sensor

Microphone

I/O Ports (terminals)

Light Level Sensor
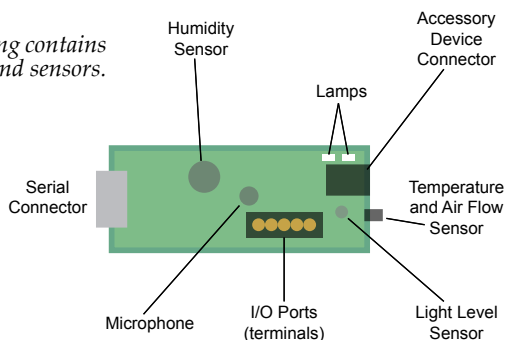
Serial Port Commands

The Weather Duck is supplied with a complete Windows, NT, 2000, and XP client and use of this client is recommended. If you wish to access the WeatherDuck and external devices, the following commands are supported.

Software:
Web page (no client)
Graphs
Realtime data
E-mail
Paging
Telnet
SMNP
Excel
Logs (CSV)

Internal Sensors:
Temperature
Humidity
Air Flow
Sound Level
Light Level

Remote Sensors:
Temperature
Air Flow
Door Position
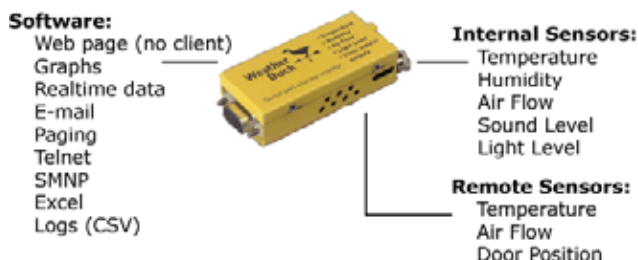
Serial Port Commands (case sensitive)

'h'	Help Menu
' '	Banner (version)
'@'	Serial number
'V'	Verbose Mode on
'v'	Verbose Mode off
'B'	Auto Report on (every 60 seconds)
'D'	Auto Report off
'T'	Temperature
'H'	Humidity
'F'	Airflow
'L'	Light
'<'	LED A on
'>'	LED B on
'l'	Latched port
':'	LEDs off

I/O Port Commands

R*n* (1, 2, 3) reads the specified port as an analog input, returning a value of 0-99, where 0 indicates complete closure and 99 indicates open.

J*n* (1, 2, 3) [V2.0 only] reads the specified port as a digital   input, returning either H or L followed by CRLF.

P*n* and N*n* (1,2,3) set port *n* high or low, respectively, returning either H or L followed by CRLF.

1-Wire Commands

The 1-wire command set provides high-level access to the Dallas Semiconductor 1-Wire protocol communicted via the RJ-11 jack opposite the DB-9 connector. The Remote Temperature sensor and Power Egg are 1-Wire devices. Consult the V2.0 software documentation for more information and examples of 1-Wire communications.

1-wire Commands (case sensitive)

'r'	Reset
'j'	Read/Write BIT
'f'	FIRST
'n'	NEXT
'b'	BYTE mode
'p'	BYTE but with strong pullup sensor

For more information on communicating with Dallas Semiconductor "1-Wire" devices the user should review the reference documentation supplied by Dallas Semiconductor.

Temperature Sensor Specifications

Sensor:
semiconductor sensor, same as internal sensor of WeatherDuck, +/- 0.5 degree accuracy.

Cable:
12 feet, Cat 2 wire (telephone wire)

Connector:
RJ-11 male

Mounting:
Four mounting clips, double sided tape mounted

Software Specifications

Operating Systems:
Windows NT, 2000, and XP running as a service. (Windows 98 can run as an application. See installation note.)

Memory Requirements:
40MB disk, 30MB RAM. (Varies with application.)

Processor Speed:
P3 or better

Processor Loading:
Average usage shows peak 1% during Web accesses.

Installation has been made as intuitive as possible and most users will not need to do any additional configuration. The system runs automatically, cleans up after itself, and automatically discovers devices.

### Web Service (local and remote)
All commonly-used features are available via a simple web-based interface. WeatherDuck Server has its own embedded web server that runs on its own port, so it will not interfere with any other web applications that may be running. A separate server, such as IIS, does not have to be running.

Graphs and Real-time Data
Graphs are automatically drawn for all registered devices and are visible on the home page of the web application. Hourly graphs are updated every minute, and daily graphs are updated every hour. Real-time data is also available on the same page.

Alarms
Alarm conditions may be set for any numeric value returned by any known device. For example, an alarm condition may be set to monitor temperature or humidity, in effect keeping an eye on your air conditioner. Email alerts are mailer whenever alarm conditions are triggered or reset.
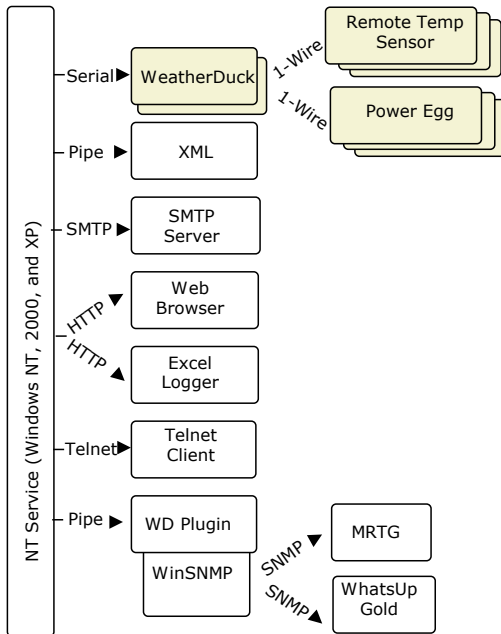
From the user's perspective, the data is presented in a number of popular standards. The casual user browses to check cabinet condition while the system developer has a number of tools to speed integration.

Webcam

If you have a Windows-compatible webcam attached to your system, WeatherDuck Server can be configured to take a snapshot at a fixed interval and display the snapshot in the web application.

XML

Realtime data is available in XML format via http, providing a straightforward way to integrate environmental data into external applications. The Excel remote logger (see below) is a simple example of XML-based integration.

Log Exporter

Sometimes the provided graphing functionality may not be adequate for the kind of data analysis you wish to perform on historical data. To address this need, historical data may be exported as html, Excel spreadsheets, or comma-delimited text. This functionality is available over the web, so you don't need to fish around on the file system.

Telnet Interface

Many administrators find that they can get things done faster using the command line. So WeatherDuck Server provides a telnet interface for text-based access to realtime data, device tables, user administration, low-level configuration, and system log monitoring.

Excel Logger

As an example of XML-based remote monitoring, we have provided an Excel template that connects to a remote WeatherDuck Server and logs data on the fly.

SNMP

WeatherDuck comes with graphing and monitoring tools of its own, but there are plenty of other monitoring applications that can keep eyes on a WeatherDuck server. WeatherDuck Server publishes its data via a WinSNMP extension, making it available to SNMP-aware monitoring tools such as WhatsUp Gold, MRTG, and IPSentry.

Examples, instructions, and MIB files are provided for the most common tools.

Software

What's inside the WeatherGoose box:
*Web*
Telnet
Mail
FTP
SNMP

Software in the WeatherGoose Family

All IT Watchdogs devices share a common code base collectively called the the "Firmware." Over 90% of the code in each device is identical – TCP/IP services, web servers, SNMP servers, e-mail servers, and protocols for communicating with attached remote sensors.

All devices support these common and standard communications protocols and data formats:

- Web (HTTP, HTTPS, WAP, PDA, XML, SSL)
- E-Mail (SMTP, POP3)
- Management (SNMP get/trap, TELNET)
- Video (JPEG)
- File transfer (FTP)

This chapter describes how the devices support each of these protocols.
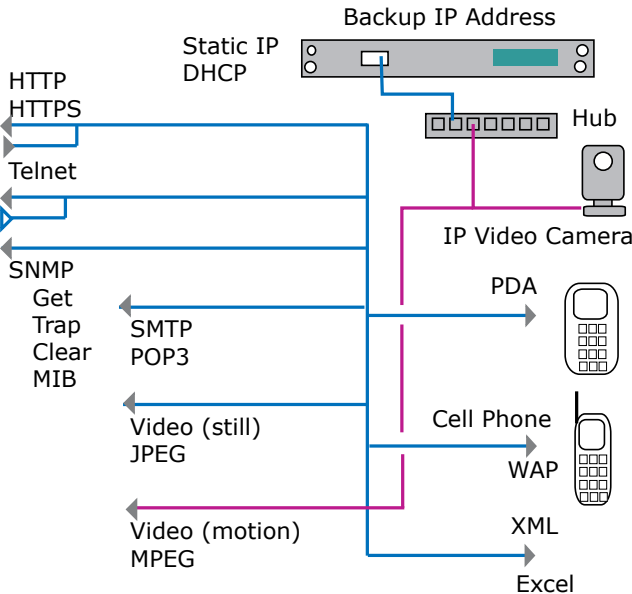
Features of the embedded firmware.

Standard Web Interface: HTTP/HTTPS

A standard web browser affords the most common mechanism for both accessing data and configuring the device.

Main Web Page

The main web page displays real-time data values and units of measurement for all internal and external sensors. Each sensor component has its own auto-scaling graph showing past sensor values. The graphs also make trends easy to pick out – if temperature or humidity is slowly rising or if airflow seems to be dropping. The real-time data and graphs refresh automatically every 60 seconds, or you can refresh by just refreshing the web page.
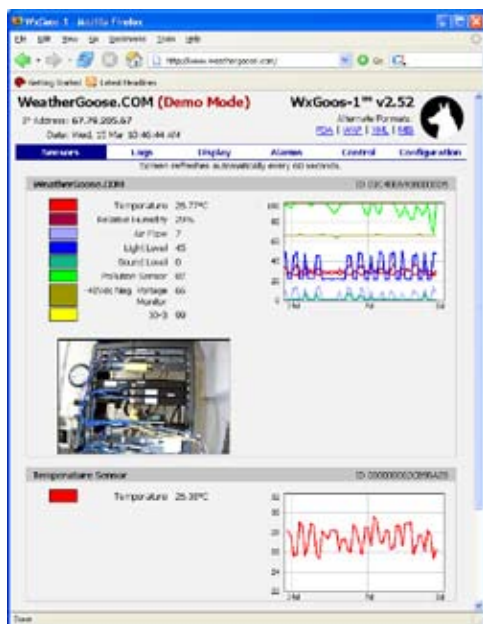
Real-time and historical data displays. Camera image lets you observe activity in the server room.

If video cameras are attached, those are also displayed on the main page. Images refresh automatically every 10 seconds. Images are simple JPEG's; you do not need to install any software or allow any client-side code to execute to view these images. Click the image to pull up the camera's web page, although this will typically require you to install client-side code to view live-action images and otherwise configure and use features of the camera. These options depend on the camera you purchased and are described elsewhere.

When you unplug or attach a new remote sensor the screen will update in 5-15 seconds. Sensor types are detected automatically so there is never any required configuration. Your device will begin to report real-time data and graph immediately.

Logs Web Page

The "Logs" web page allows you to further access historical log data and build custom graphs. The single graph on this page is larger than those on the main page, and input controls let you select the time range and specific sensor values to display. For example, you could use this to compare temperatures across all your attached devices over the past 14 days.

You can also download raw data values to your local computer in comma-separated value (CSV) format. This can be opened directly in Excel, imported into a database, or parsed from a script. All attached sensors are included in the log. If a sensor wasn't attached for the entire duration, "0" values are used to indicate this in log output. Warning: Log data can take a long time to download from the unit – sometimes even 15-30 minutes if you have a lot of data; be patient!

Because an embedded computer has limited memory, we have to start dropping old log data as new data comes in. Although the amount of memory used for logging is fixed, you can control how often logging occurs

and thereby control how far back in time the device will keep data. This affects both graph data and downloadable logging data.

The web interface lets you control how often logging occurs and lets you delete all current log data. An on-screen message will tell you how many hours/days/weeks of data you can accumulate. This formula depends on how often you log (more frequently means more data which means less total time saved) and how many remote sensors are connected (more sensors means more logging data which means less total time saved).

Build graphs with custom data and time series. Download log data to database of spreadsheet.

Display Web Page

The "Display" page lets you customize display options affecting not only the web interface but also data in other protocols.

The internal sensors and all attached devices can be given a custom name. For example, the internal sensors might be titled "Room 203, Cabinet 13." A remote temperature sensor might be titled "Top of cabinet" or "Behind blade servers." These labels appear everywhere in the web interface and also in e-mail alerts and network monitoring consoles so it's easy to what sensor you're looking at.

All sensors also have unique-in-the-world 64-bit identifiers also displayed in all protocols and web pages. This is especially useful for scripts and other automated systems where you want to depend on the device and not on the human-readable (and changeable!) name given to that device. Even if a device is unplugged and plugged in later, the unique ID is preserved along with all custom titles and alarms.

Custom names can also be given to the 3 analog IO ports.

You can also control units of measurement for display such as Fahrenheit/Celsius for temperature.

Alarms Web Page

Any sensor on any internal or external device can be separately configured. The page displays the current real-time sensor value and lets the

Use "Friendly Names" to keep track of your sensors and where they are located.

administrator set too-low and too-high threshold values and which action to take if the value passes the threshold.

Actions include sending emails, sending SNMP traps, sounding the internal or external buzzer (for devices that have a buzzer), or any combination of these actions.

Alarms are sent when a threshold is crossed ("tripped") and will send "all clear" when the sensor returns back over the threshold. A potential problem with this is getting a flood of alarms when a value vacillates over a threshold without being firmly on one side or another. In this case, our algorithm will send the "tripped" alarm but will not send "clear" until the value is firmly and consistently within the acceptable threshold.

From this web page you can also send test alarms. Any sensor on any attached device and any possible alarm ("tripped" or "clear") and any action (email, trip, buzzer) can be select for simulation.

Also displayed on this page is a log of internal device activity and errors. This is mainly useful when something is going wrong (e.g. you're not receiving emails) and you're trying to diagnose the problem. This is also useful for our own tech support because often we can read things in the logs that a customer might not see.

Configuration Web Page

The "Configuration" web page allows the administrator to configure many aspects of device behavior.

For network settings, the device can be configured with a hard-coded IP address, network mask, and gateway, or the device can get an address automatically through DHCP or BOOTP.

The telnet and SNMP servers can be independently disabled.

The HTTP or HTTPS server can be disabled (but not both). The port numbers for HTTP and HTTPS can be changed (the defaults are 80 for HTTP and 443 for HTTPS).

Set alarm thresholds. Get alerted by email, SNMP, trap, or audible buzzer. Use the form at the bottom of the page to test alarms.
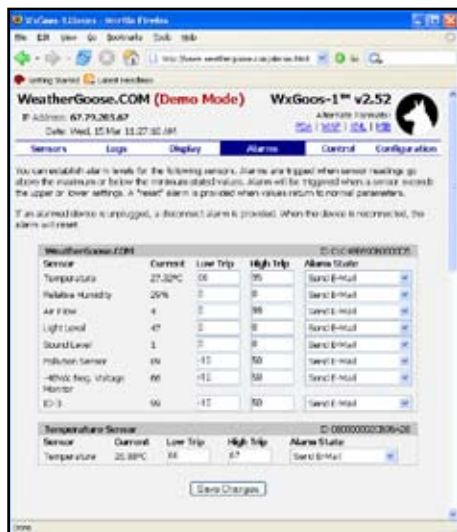
If an NTP time server is available you can configure this in the device and it will keep time automatically. This is especially useful for logging and alerts because the device can use proper time-stamps. The NTP servers can be configured by the administrator; by default these are set to public US military time servers.

Email alarm settings can be configured as well: SMTP server, the "From" email address, and up to five other email addresses can be set. If you need more than five addresses, create an email list in your email server and name the list when you configure our device.

Some email servers require POP3 authentication before SMTP can be used. For those cases you can configure the POP3 server, username, and password to be used.

Up to four SNMP trap target IP addresses can be configured for alarm traps.

The web server can be configured with up to two different access accounts. By default anyone can access any web page. If you configure a "read-only" user account, all web site users are required to log in before seeing any web page. If you configure an "administrator" account, users of the "Display," "Alarms," and "Configuration" pages must log in with that username and password.

If only "administrator" is set, the "Main" and "Logs" pages will not require passwords but the other pages will.

Finally, you can set administrative properties for the device including device location and main contact name, phone number, and email address. This information is displayed in various places including the footer of all web pages.

PDA Web Access

The "PDA" page makes it easy to view real-time data and video content from a portable device. This web page is specially designed to be viewed on a narrow screen – fonts are small, data is displayed vertically, and the header and footer are compressed. The screen will always be viewable as small as 240 pixels wide.
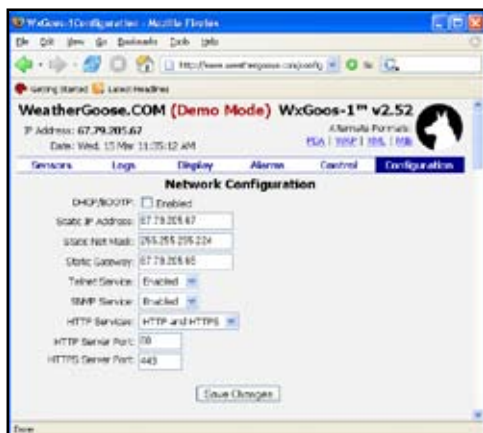
Set static or dynamic IP address and port numbers.

Cell Phone (WAP) Web Page

The "WAP" page makes it easy to view real-time data from a WAP-enabled cell phone. WAP is a web protocol designed for extremely compressed data displays such as a standard cell phone.

XML Data

Almost all device data is available in XML format for scripts, consoles, and other automated devices.

Data includes device-specific information (IP address, serial number, MAC address, location, tech support contact data), alarms (all settings, which have been tripped), sensors (all devices, all sensors with ranges, units of measurement, and current values), attached video devices, and internal logging data.

General Web Server Characteristics

An important requirement for our web server is that it "plays nice" with firewalls, proxy servers, strict client-side scripting rules, and other security devices used to prevent malicious attack. All our web pages use standard HTML, CSS, and static images, so it passes through all security measures. We use no Active X, Java Applets, or any other client-side executable objects. We do use JavaScript, but if your browser disables it we will still function properly.

We actively test support for IE (v5.x, v6.x), FireFox (v1.x), and Opera. We also test our web pages for compliance with W3C standards for HTML 4.0 and CSS 1.0.

All our web content is available using either normal HTTP or HTTPS (HTTP over SSL) for encryption and authentication. The administrator can disable either protocol.

Our web server can withstand denial of service attacks. If the server is flooded with requests it will stop responding to new requests for a few seconds until the attack subsides, at which time the server will start responding normally again. An attacker could therefore "shut down" the web server using a flood attack, but an attacker cannot use this technique to permanently disable the unit. This is similar to the behavior of Apache and IIS (although it happens faster because we have much less memory available in the embedded environment).

Our web server can also withstand various data-type attacks: malformed queries, buffer overflows, etc. We have tested this internally both with custom attacks as well as standard script-based attacks available on the Internet. Our customers have also used various techniques to test our server. If our server detects any type of incorrect query it will immediately shut down the request and prepare to accept a new request.

Secure HTTP: HTTPS = HTTP + SSL

For secure, encrypted, authenticated access to the web site we support HTTPS, also known as HTTP/SSL or HTTP/TLS.

You access the secure web site by typing "https://" instead of "http://" in your browser address bar. You'll be prompted once to accept our certificate. Most browsers indicate secure access with a picture of a key in the bottom-right corner of the browser window.

The "certificate" is a mechanism for a web server to identify itself to browsers. We have our own certificate; other companies will have other ones. Because your browser doesn't automatically trust our certificate, it prompts you when you enter the device page for whether you want to trust this source. If you want to disable that dialog, configure your browser to trust our certificate (usually you can do this in the prompting dialog, but this depends on your browser and browser security settings).
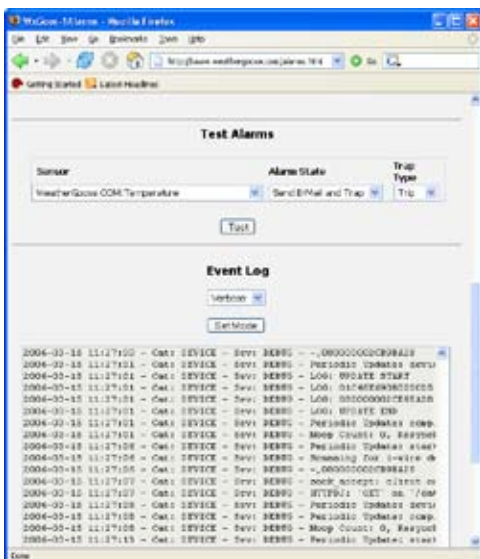
Management Consoles – SNMP

All our devices support SNMP – the standard for monitoring internet-enabled devices.

We support all SNMP v1.0 commands including GET, WALK, and TRAP. We support the SNMP data formats described in RFC's 1902, 1903, and 1904. We also have our own data located in the IT Watchdogs enterprise section of the OID tree.

Without any special configuration you should be able to walk all our device values. This includes standard data such as vendor information,

Internal event logger helps identify and correct config-uration errors.

Three password levels allow you to control unit access.

uptime, and network configuration as well as IT Watchdogs information such as friendly names and real-time sensor values.

Most SNMP consoles allow you to load a MIB – The definition of the data provided by an SNMP device. Loading the MIB gives you human-readable labels for each piece of data, data types for the data (e.g. integer in the range 0..100), and human-readable help-text for each piece of data. MIB's also contain definitions for all the traps the device can send proactively to the management console.

The MIB for each device is available in a ZIP file downloadable from the device's web page. The technique for loading the MIB is different for every management console. The MIB contains information that will let your console automatically detect when it is viewing an IT Watchdogs device and will automatically show you the MIB-supplied data.

Our MIB contains definitions both for the data values and the traps that are sent by the alarms system. Each possible alarm has two trap definitions – one for "tripped" and one for "clear." This is defined clearly in the MIB itself.

Our SNMP traps not only define the required values (OID causing the trap, IP address of the device sending the trap), but also defines optional user-defined fields. In these fields we put the device and sensor friendly names, the value of the sensor when it was tripped/cleared, and other information. You can safely ignore these values, and management systems that don't support this will ignore this data.

XML data is machine-readable by consoles, scripts and MS Excel®.

You can test our SNMP traps in your console using the "Test alarms" feature in the "Alarms" web page.

Our SNMP and MIB implementations have been tested against many SNMP-enabled systems including What's Up Gold, HP OpenView, libsnmp, MRTG, and a variety of packet-sniffers.

Email Alerts – SMTP, POP3

Both "tripped" and "cleared" alerts can be configured for any attached sensor. See the "Alerts Page" section above for details on alarm configuration and "Configuration Page" above for details on how to configure your SMTP and POP3 servers.

Some email servers (e.g. Microsoft Exchange) don't support SMTP by default. For those systems you will need to configure your server to accept SMTP connections, or at least accept those connections originated from your IT Watchdogs devices.

Some email servers require POP3 authentication before SMTP can be used. For those cases you can configure the POP3 server, username, and password to be used. The device will make the POP3 connection prior to

the SMTP connection and will log and error if this cannot be done or if the POP3 server reports an error.

When using the POP3 method, some email servers get confused if you use the same "from" email address in the IT Watchdogs device as you do a normal email client. You should configure a special "from" email address just for IT Watchdogs device alarms to avoid this problem.

Video

All our devices support these web cameras:

- Axis 205
- Axis 206
- DLink DCS-900
- DLink DCS-950
- DLink DCS-950/G

Each camera has various features on its own. In our devices we support loading the static image for the web pages and sending those images to the IT Watchdogs Console.

All cameras provide real-time motion through downloadable client software, but this software is not required to view the images through our devices or through our Console.

Upgrades

IT Watchdogs makes all firmware upgrades available for free for all customers. We're constantly adding features (and fixing bugs).

You can always download the latest firmware from our web site:

http://itwatchdogs.com/downloads.shtml

Version history is at the bottom of that page so you can see what you're getting.

Firmware is distributed as a ZIP file of about 500k. Inside the file is an "installer" Windows application. Double-click the application (or run from the command-line) and you will be prompted to select the IP address of the device you wish to update. After ensuring the displayed configuration is correct, the application will upload the new firmware for you by sending the new firmware image over FTP.

The application will alert you to any errors and can recover automatically from certain kinds of errors

The ZIP file contains additional files such as installation instructions, our SNMP MIB, and product errata.

PDA format is easily readable on screens as narrow as 240 px.
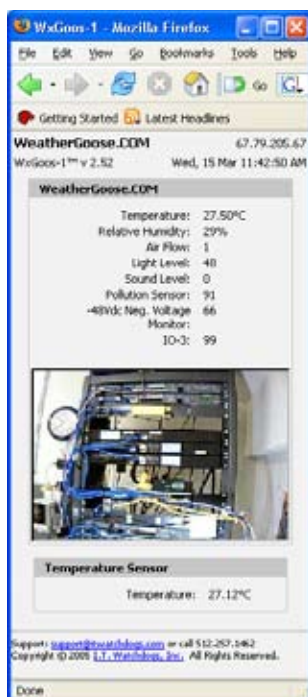
WAP format is specially designed for web-enabled cellular phones.
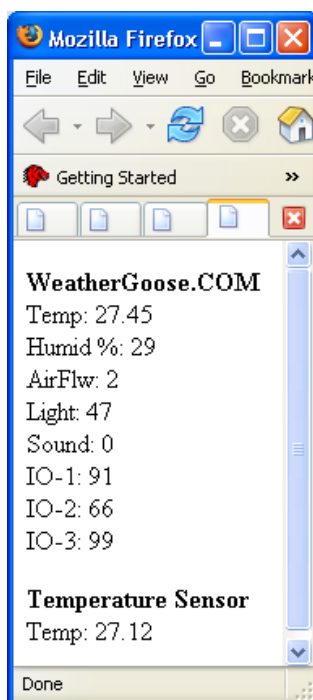
Watchdog Console 2.3

A web-based data consolidator and manager for multiple ITWatchDogs devices that displays sensor data, security camera views and device configurations on a single, video-enabled web page.

WatchDog Console 2.3

- ▪ Camera images on single web page
- ▪ Up to 100 units monitored
- ▪ Low cost, simple to install
- ▪ Consolidated graphs
- ▪ Video thumbnails show alarm state
- ▪ No SNMP setup required
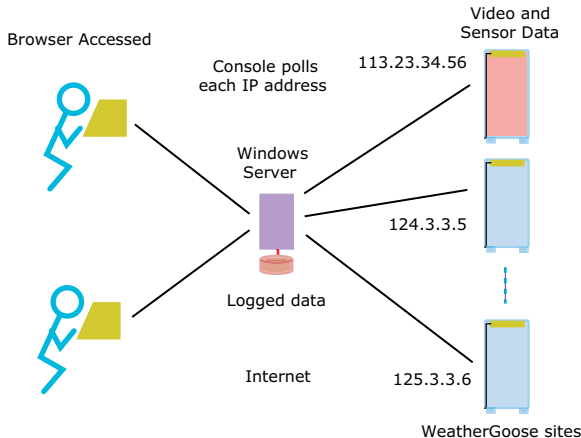- ▪ Easy firmware updating
- ▪ Auto detects sensor additions
- ▪ Produces HIPAA logs
- ▪ Configure alarms across multiple units

Multiple Server Room Monitoring

Each IT WatchDogs monitoring device can be used with a variety of popular monitoring packages such as What's Up Gold, Nagios, IP Sentry, OpenView and other SNMP-based monitors. Each IT WatchDogs device internally contains the SNMP data known as the MIB.

However, where specific monitoring of IT WatchDogs equipment and

Browser Accessed

Video and
Sensor Data

Console polls
each IP address

113.23.34.56

Windows
Server

124.3.3.5

Logged data

Internet

125.3.3.6

WeatherGoose sites

Monitor, control and upgrade multiple heterogeneous devices from a single web-based application.

single web page presentation of multiple video cameras is desired, the WatchDog Console is a good alternative. Installation is fast and simple; the user simply types in the IP addresses of the devices to be monitored. No SNMP experience is required. Setup takes minutes.

The problem of updating firmware for dozens of Goose devices has been solved. Users can selectively upgrade firmware multiple devices by a single mouse click and receive affirmation of the upgrade.

Easily standardize your alarm settings across all your units simultaneously. Browse, sort, and select alarms based on your criteria and update with a push of a button.

The software can be installed on almost any Windows PC and can be accessed using only a Web browser - no client software is required.

Devices are monitored continuously and data is available in various formats including tables, graphs, and on-disk CSV log files.

A security camera view consolidates video from remote server rooms. The video consolidation page gives the user a visual summary of the device (a WeatherGoose, for example) condition in two possible modes: Full and Terse.

View Data from One Web Site
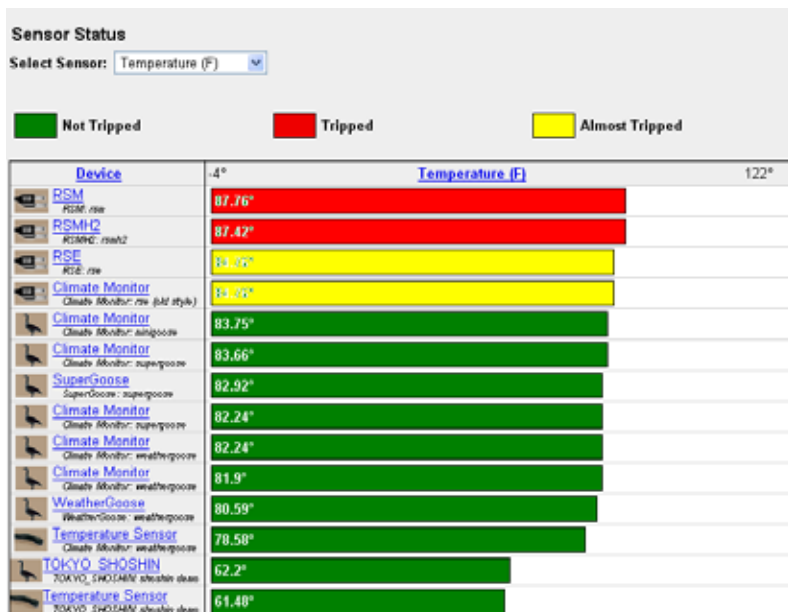
Graph views consolidate sensor data from multiple devices, and colors clearly indicate device status.

Specific data consolidation features include:
▪   Continuously log all sensor readings to on-disk Excel (tm) and database-compatible CSV files. Packages data by day, week, or month.
▪   Compare sensor readings across devices with a stacked-bar view.
▪   Graph sensor readings across devices with overlapped line-graph view.
▪   Security Cam view displays thumbnail array of all web-cams.
▪   Color-coded bars indicate when devices are currently in or close to an alarm state.
▪   Category-based alarm browsing.

Logging Data to Excel Files

Devices are monitored continuously and data is available in various formats including tables, graphs, and on-disk CSV log files. Excel or other database tools can be used with the data.

Variety of ITW Devices Monitored

The web-based Console 2.1 device manager lets you remotely manage multiple, heterogeneous (mixed type) devices. View all device types and current firmware versions.

Most ITWatchDogs devices and sensors are supported:
▪ WeatherDuck
▪ WeatherGoose (WxGoos-1)
▪ SuperGoose (WxGoos-2)
▪ MiniGoose (WxGoos-3)
▪ PowerEggs
▪ Variable Speed Fan Controller
▪ All remote sensors
▪ All web-based and USB cameras
▪ Many ITW-based OEM devices

The Security Camera View permits real-time visual observation of multiple heterogeneous devices with a single web-based application using standard USB and web-enabled cameras. Camera feeds are arrayed and color-coded, enabling quick system diagnosis.

Sensor Consolidation and Graphing

The WatchDog Console continuously records data from all internal and external sensors from each configured device. Sensor data can be viewed and processed in several ways.

The "Graph" view superimposes sensor values from multiple devices. The user can pick which type of sensor to graph (e.g. temperature, air flow, amperage) and all applicable values are displayed. The user can also select from several time intervals.

The "Status" view displays a table of sensor values from multiple devices. Colored bars show values visually; the color is red if the value indicates an alarm condition, yellow if the value is close to an alarm condition, or green if the value is well within the alarm threshold. Sort by values or by device. Click any device

If any devices are currently off-line they are displayed at the bottom with an appropriate error message to assist the operator in diagnosing unexpected failures.

The console automatically detects all sensor types, valid ranges, and units of measurement. When new devices or sensor types are added, this meta-data is detected automatically.

Security Camera View

A security camera view consolidates video from remote server rooms.

Watch all your remote server rooms at once and in real time with the "Security Camera View." USB and web-enabled cameras connected to monitored devices are automatically detected and arranged on the security camera web page.

Colors clearly call out devices in or near alarm conditions. Click an image to visit the website for that device.

Additional web-enabled cameras can be added to the view even if they are not attached to an ITWatchDogs device. A form at the bottom of the page lets you enter additional devices which are displayed at the end of the list.
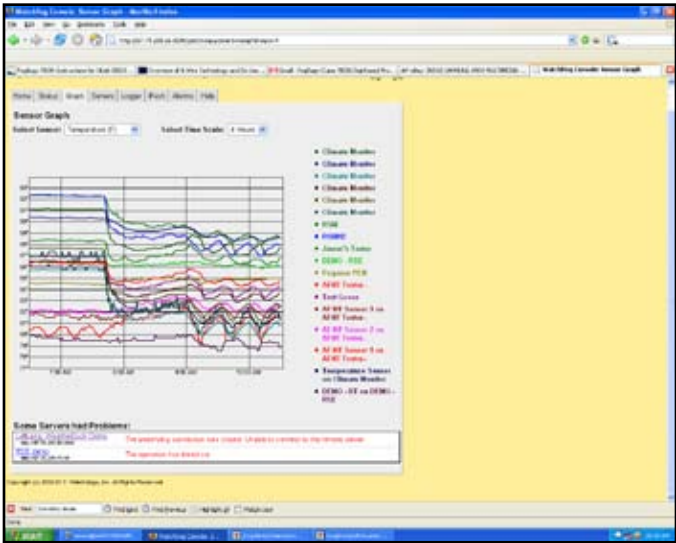
Sensor values from multiple devices are superimposed simultaneously. Suspicious values may be called out quickly while devices that cannot be contacted are displayed at the bottom of the screen.

Data Logging - HIPAA Logs Created

All sensor data can be logged to on-disk files for long-term storage, analysis, and process compliance. Values are stored in the industry-standard CSV format compatible with Excel and most databases.

Each log entry contains a date/time stamp taken from the host Windows server and a reading from every sensor on every attached device. The administrator controls how often log entries are made.

The administrator sets the on-disk directory that should contain the log files. Sensor data is packaged into files by day, week, or month.

Simplified Remote Device Upgrades

Selectively upgrade multiple devices simultaneously for new device firmware releases. See which of your devices are currently down.

The WatchDog Console can remotely and simultaneously upgrade heterogeneous devices.

*Push new firmware upgrades onto multiple heterogeneous
devices simultaneously.*

The "Push Firmware" view displays all devices with their type and currently installed firmware version. The administrator can quickly see which devices are not on the desired version.

New firmware (supplied by ITWatchDogs) is placed in a directory on the local hard drive. The Console automatically associates these firmware versions with each device according to its type.

The administrator indicates which versions should be applied to which devices using a drop-down box. Then, with the push of an "Update" button, firmware is pushed out to the remote devices. While the upgrades are in progress or devices are rebooting after upgrade, the console shows percent complete or "rebooting."

Upgrading devices, even in the field, is easy with WatchDog Console v2.1. Current firmware versions and available upgrades are displayed for each system device.

Multiple alarms on multiple devices can easily be adjusted, saving hours of configuration time.

For even faster upgrades, the Console displays a list of versions at the bottom of the screen which the administrator can use to upgrade all units to the same version. Any units already on that version are left alone.

If the network connection is interrupted during an upgrade, the Console will continue to retry upgrades until they are complete. Do not interrupt power to a device that is only partially upgraded as the unit could be damaged as a result.

Device Configuration

Each device is configured by supplying its IP address or host name and the port on which its web server is running. If a read-only user name and password is in effect, that must also be supplied to the console.

Each device also gets a short description in addition to the friendly names configured inside the device.

Configuration inside each device is picked up automatically and used by the Console. For example, all friendly names for devices and external sensors are used for tables, graphs, and logging.

Devices can be configured even if they are not yet available on the network. Whenever devices become unavailable, they are displayed at the bottom of the web page with a descriptive error message.

Configuration data is stored as an XML file and can be backed up or generated by another system.

Alarm Configuration

Use the alarm configuration feature to set an alarm across multiple sensors and units. This allows for easy standardization of alarm trips.

Simply select the desired sensor location and type and the WatchDog Console will display all sensors matching those specifications. Furthermore, the resulting sensor list is sortable by any of its categories: Name, Current Value, Low Trip, High Trip, and Alarm Setting.

Update any sensor alarm setting by selecting its corresponding check box, keying in the new alarm values, and clicking 'Set Alarm.' Alarms that are in the process of updating are identified, as are any problems that were encountered during the alarm update process.

Server Requirements

Supported on Windows 2000/XP/2003 Server platforms. Requires 100MB of memory and 10MB bytes of disk excluding log files. Processor loading is minimal.

Summary of Features

- Runs as a Windows service. Can be started and stopped remotely.
- All functions available from web-based interface.
- Supports hundreds of devices.
- Automatically detects changes in remote sensors attached to devices.

Remote Sensors

Temperature
Humidity
Air Flow
Water
Door
Current
City Power Monitor
-48 VDC Battery Monitor
CCAT Interface

Remote Temperature Sensors

Small and accurate, up to 16 remote temperature sensors can be used in WeatherGoose Climate Monitors.

- Small and lightweight
- Factory calibrated
- +/- 0.5 degF accuracy
- Unique 64 bit address
- Uses Cat 3 telephone cable
- For use with: WeatherGoose, Super-Goose, MiniGoose and WeatherDuck

Using RJ-11 connectors and Category 3 cable the tempera-ture sensor includes two nylon mounting clips.

The sensor comes in two cable lengths, 20 and 100 feet. Total aggregate cable length limit is 600 feet.

Measure Remote Temperatures

Up to 16 of these accurate sensors can measure critical locations in a server room over distances of hundreds of feet.

Typical locations are:
- Air conditioning inlet (return air)
- Air conditioning output (vent)
- Room temperature
- Internal cabinet temperature
- Hottest cabinet location
- Outside (requires a rain shield)

Simple Multidrop Wiring

Up to 16 sensors can be attached to any WeatherGoose Climate Monitor using Category 3 or equivalent wiring. The aggregate wire runs should not exceed 600 feet.

Avoid home-run wiring if possible; distribute sensors at end of runs using a splitter.

Specifications

Celsius range: -20 deg C to 50 deg C
Fahrenheit range: -4 deg F to +127 deg F
Sensor: Maxim 18b20, TO-92 case
Cable: 20' or 100'
Conductors: 2 (pin 1 and 2)

Model Code: RT-20 (20 foot cable)

                   RT-100 (100 foot cable)
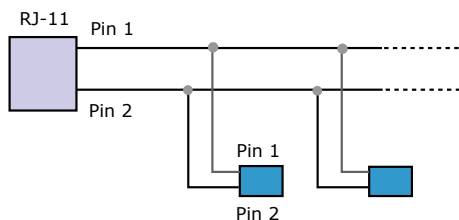
Telephone splitters can be used to add additional sensors up to the maximum of 16.

Note that the temperature sensors are polarity sensitive. Splitters with a "crossover" wiring arrangement will not work. Telephone punch-down blocks can be used.
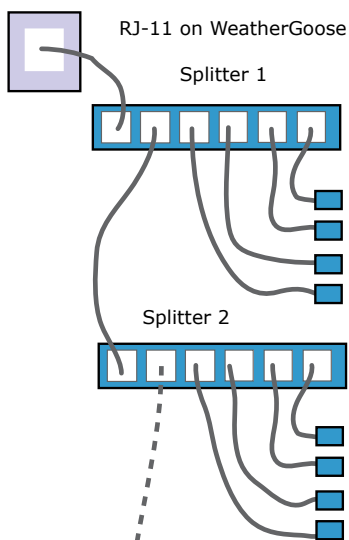
Multidrop wiring permits 16 temperature sensors to be added to any WeatherGoose Climate Monitor. The sensors are polarity sensitive. Each sensor is automatically discovered by the Weather Goose and can be given a friendly name.

Temperature, Air-Flow, & Humidity Sensor

A multipurpose, remote temperature, air flow, and humidity sensor for use with WeatherGoose climate monitors.

Remote Temperature, Air Flow & Humidity Sensor

Built to monitor internal computer cabinet or server room conditions, the RTAFH sensor contains a temperature, humidity and air flow sensor. Up

Both varieties of the sensor are housed in a ventilated, 4-inch Delrin plastic tube. The nylon clamp permits sensor attachment to both metal and wood surfaces. Cable lengths of 20 and 100 feet are available.

to 16 RTAFH sensors can be attached to any of the WeatherGoose family of climate monitors.

Temperature and humidity are measured by industrial- grade digital sensors with excellent accuracy.

A Delrin plastic tube contains all the electronics - the sensor is powered by the WeatherGoose power. A nylon strap allows secure mounting. The sensor is supplied in 20' and 100' cable lengths, although the user can add or shorten the cable as required. Maximum cable length is 600' aggregate length.

Temperature Sensors

Range: -40 to 40C (-40F to 140F)
Sensor: Maxim 18B20 semiconductor
Accuracy: +/-0.5C
Humidity Sensor

RH Accuracy   ± 2% RH,
Sensor: Honeywell HIH-3610
Repeatability: ± 0.5% RH
Response time, 15s in slowly moving air @ 25 °C
Range: 0 to 100% RH, non-condensing
Air Flow Sensor

Range: 0 - 100 relative air flow
Sensor: amount of heat change method (see below)
Repeatable accuracy: +/-20%
Scale: uncalibrated, zero air flow reads 20.
Operating range: 65 to 110F (18 to 43C)

Air Flow Detection

Air flow is computed by comparing a periodically heated temperature sensor to a separate reference temperature. Faster air flow causes more rapid heat increase. The sensor's dynamic range approximates common computer cabinet internal air movement. The physical amount of air moving

is not computed. Still air reads about 20 on the 0 to 100 scale. The sensor is immune to temperature change in cabinet and most room environments.

Installation

The air flow sensor's open end should face the air flow source for maximum sensitivity. Mounting the sensor perpendicular to air flow will reduce sensitivity and may cause air flow values to fluctuate due to turbulence. The sensor should be located in the hottest part of the cabinet or room. Rigid mounting is recommented to avoid movement in the air which can cause erratic readings.

Model Codes

RTAF- 20 Temp and Air Flow, 20' cable

RTAF-100 same as RTAF-20 but with 100' cable

RTAFH-20 Temp, Humidity, Air Flow, 20' cable

RTAFH-100 same as RTAFH-20 but with 100' cable

Remote Air Flow, Temperature Sensor

Preferred direction of air flow
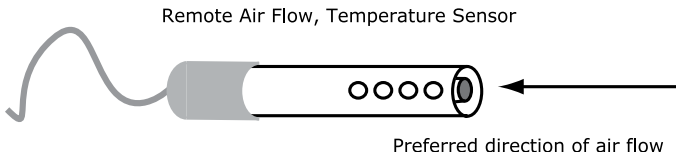
The air flow sensor exhibits maximum sensitivity when the open end faces the airflow. This orientation minimizes internal turbulence within the protective plastic tube.

Splitters   RJ-11 jacks

WeatherGoose

Cat 3 cable
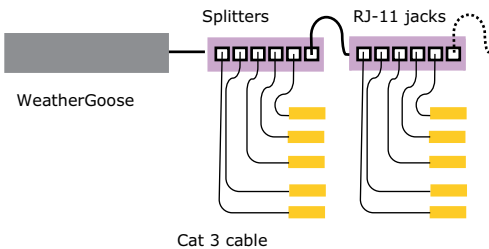
Telephone-type splitter blocks permit up to 16 RTAFH sensors to attach to the WeatherGoose series of climate monitors.

Punch-down blocks can also be used to connect the Cat 3 wires.

Water Sensors

Each WeatherGoose Climate Monitor (except the MiniGoose) contains a three-port I/O connector, called the "C123C" port. Up to three individual water sensors can be attached to this port. If more sensors are needed, they can be wired in parallel and report as a group.

The I/O ports are supplied with a +5VDC supply voltage which senses whether water is present due to the change in conductivity in the water sensor.

The water sensor can show whether the sensor is dry, damp, or completely immersed in water. Increasing dampness will be shown as a downward trend in the graph as conductivity increases.

A water sensor shown with the metal water detectors pointed up. These metal brads must face down when installed.

Conductivity Bridge

The water sensors continuously measure the conductivity of the environment they are immersed in. In dry air, the reading should be about "99". When placed in a glass of tap water the reading should be around "50". Intermediate values show the conductivity increasing as the reading decreases.

The sensors connect to the WeatherGoose with 24 AWG solid copper wire. Runs of over 100 feet can be used.

Prevent Sensor from Moving

Most sensors are mounted out of sight under flooring, in pipe closets, or in overhead water catch trays. If the cables are moved, there is a possibility of the sensor losing its most sensitive position or becoming airborne. Some users place bricks on their water sensors, but ITW recommends tie-wraps or epoxy glue to wooden brackets.
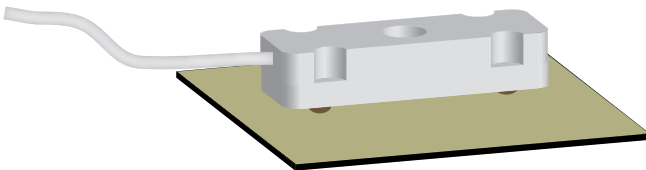
When mounted in a metal tray, mount the sensor face down on an insulating surface such as a vinyl floor tile. Secure the sensor with tie wraps or wooden brackets.

Testing the Sensors

ITW recommends testing the water sensors to verify that the each water sensor sends an alarm and that the e-mail arrives at the proper address. Testing requires the sensor be immersed in a cup filled with water and the transmission of the alarm verified.

Cable Length

Cable runs of 100′ and over are common. Use 22 or 24 AWG solid wire for easy insertion into the C123C I/O ports.

Model Number: WD-1 (Includes 15′ of cable)
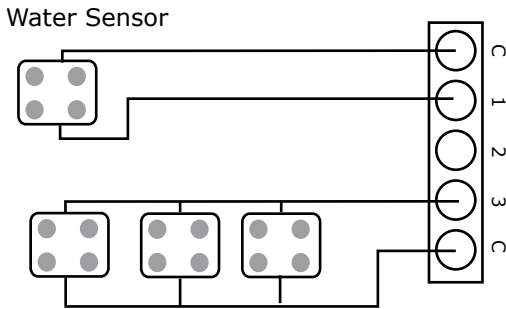
Connect the sensors to the C123C block. "C" is common (ground). If more than three door sensors are to be used, they can be wired in parallel (not series). When wired in parallel, when one sensor becomes wet it will alarm as a group.

Door Sensors

Use these small magnetic position sensors to determine door position

Each WeatherGoose Climate Monitor (except the MiniGoose) contains a three-port I/O connector capable of determining the position of doors. This connector is referred to as the "C123C" port.

These ports are supplied with a +5 vdc supply voltage that sense whether the door sensors are open or closed.

The sensors are standard magnetic door sensors used in security applications. Either Normally Open or Normally Closed Sensors can be used. ITW recommends Normally Closed sensors (door closed, switch closed) so that a alarm can be generated if the connection wire breaks.

The sensors mount in two parts; the switch body (the part with the screw terminals) and the magnet. These should be mounted as close as possible. The range of operation is about an inch. The third part is a plastic screw terminal cover.

Installation

The sensors are normally mounted with self-tapping screws. Some users report using double-sided tape but ITW does not recommend this because the tape can dry out and lose adhesion.

The sensors connect to the WeatherGoose with 24awg solid copper wire. Runs of over 100 feet can be used.

Alarm Send Delay

There is some delay between a door opening or closing due to two factors: First the polling of the sensors can take up to five seconds, and second, the delay of the e-mail alarm message to travel over the Internet.
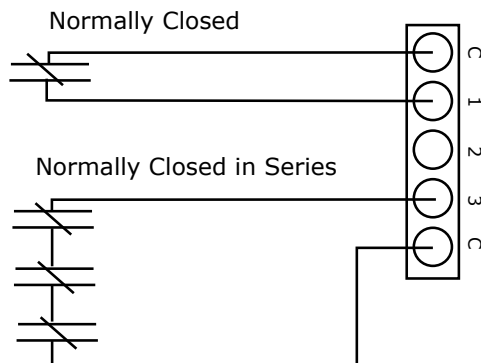
Connect the sensors to the C123C block. "C" is common (ground). If more than three door sensors are to be used, they can be wired in series (Normally Closed). When one opens, the current ceases and a alarm is sent. If Normally Open sensors are used they should be wired in parallel.

Door Sensor

Setting Levels to Alarm

When one of the C123C contacts are shorted (closed) the reported value approaches zero, typically values of 2 or 3 are seen. When the contact opens, the value jumps to 99. Set the alarm to have a least 10 units above and below these values to avoid edge-value triggering.

ITW recommends testing the door sensors and verifying that the each door sensor sends an alarm and that the e-mail arrives at the proper address.

Model Number: MS-1 (Includes 30 of cable and one sensor set)

Current Transformer

Measure 30, 60, or 120 amps. Transformer clamps around power wire.

A current transformer with switch selectable 30, 60, or 120 amp settings.

Clamps Around Existing Cable

Current transformers clamp around a single current-carrying wire and transform the amperage into a 0 to 5 VDC signal suitable for input into the I/O ports of a WeatherGoose Climate Monitor.

Each WeatherGoose Climate Monitor (except the MiniGoose) contains a three-port I/O connector, called the "C123C" port. Up to three individual current transformers can be attached to this port. If more are required, a CCAT serial bus interface can be added. Up to 16 CCATs can be added to the serial bus.

The current transformer uses swing-open jaws to clamp around a current carrying wire. Note that a single wire is necessary for current measurement. If two wires are placed in the transformer, their magnetic fields will cancel each other and the current measurement will not be accurate.

Self-Powered, Linear Output

The transformer is manufactured by Flex-Core and further specifications are at: http://www.flex-core.com.

No power supply required; the transformer is parasitically powered from the line current.

The sensors connect to the WeatherGoose with 24 AWG solid copper wire. Runs of over 100 feet can be used.

The output is linear. Note that the current values displayed are 0 - 100 in the WeatherGoose. If a CCAT interface is used, a current range can be specified.

Specifications

Range: 0 to 30, 60, 120 amps, switch selectable
Output: 0 - 5 VDC

Response time: 2 seconds
Size: 2.9″ L x 2.58″ W x 1.04″ H
Wire opening: 1.1″ L x .9″ W
Approvals: UL listed E150462
Model Number: H922

Cable Length

Cable runs of 100′ and over are common. Use 22 or 24 AWG solid wire for easy insertion into the C123C I/O ports.

The jaws swing open and a wire can be inserted.

Current Transformer
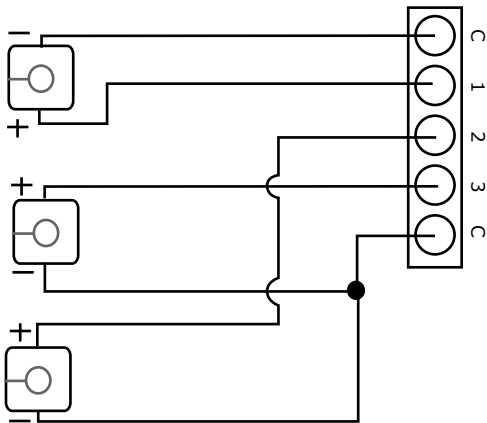
Connect the sensors to the C123C I/O ports connection block. Note polarity on current transformers. CCAT interface can also be used.

Model Number: CT-30/60/120

Includes 15′ of cable

City Power Monitor

Know when city power fails and your gear is running on the UPS

The CPM contains a wall transformer and a voltage converter. It plugs into a standard 15 or 20 amp wall receptacle. Up to three can be attached to a WeatherGoose or a SuperGoose.

- Input voltage range: 100 - 240 VAC
- Get notification immediately of outage
- Connects to the I/O ports
- Receive e-mail, pages on power outage

When the city power fails, the UPS takes over running the equipment. The time for operation can be minutes or hours before the battery is exhausted.

Add to this, the air conditioning in the room is probably inoperative and your gear is getting hot.

Up to three CPM units can be used.

The standard WeatherGoose graphing functions are used which will show if city power has been interrupted.

Specifications

Input Range: 100 to 240 VAC
Output: 0 to 5 VDC
Current draw: <20 ma.
Cable to monitor: 36", 22 AWG solid
Attach: I/O port (C123C)
Enclosure: black plastic wall transformer
Dimensions: 3" L x 2.25" H x 0.5" W
Response time: 10 seconds plus Internet data communication time.

Connections

GREEN: WeatherGoose analog I/O terminal block, "C" terminal (ground)

RED — WeatherGoose analog I/O terminal block,   analog input "1", "2", or "3"

UPS

To Equipment

To WeatherGoose
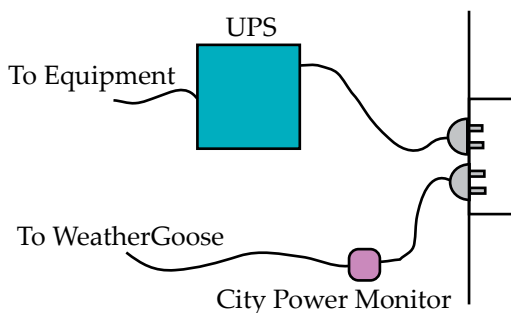
City Power Monitor

The CPM must be connected directly to a receptacle supplying city power and not to the UPS power. Graphs will show loss of city power.

City Power Monitor

Green —

Red +

City Power -
not UPS Power

WeatherGoose I/O ports
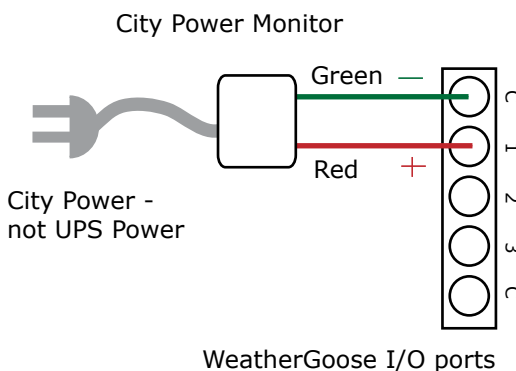
Wiring is simple: the city power monitor converts the line voltage into a 5 VDC signal. When the power fails, the voltage goes to zero and an alarm can be generated. Wiring lengths over 100' can be used.

Air Quality Sensor

This compact unit, when connected to a WeatherGoose or SuperGoose, can be used to monitor the air quality in your server room or other indoor environment.

- ▪ Sensitive to over 30 different airborne contaminants.
- ▪ Early detection of potential air-quality problems.
- ▪ Wall-mountable unit, smoke detector size.
- ▪ Easy to install and use.
- ▪ Solid-state detector for reliability and long life.

The sensors can be wall or ceiling mounted. A separate power supply (not shown) connects to wall power. Pick a location with good air flow such as an air conditioner return air vent.

Indoor air quality is often a concern, particularly when it comes to the supposedly "clean" environment of a server room. By continuously sampling the air passing over its internal sensor, the AQS provides IT operators another valuable tool to help monitor the health of their equipment by giving early warning of the presence of potentially damaging contaminants in the air, such as:

COMBUSTIBLES:
Methane, Ethane, Iso-butane,
Propane, Ethylene, Hydrogen,
Methyl Ether

VOLATILE ORGANIC COMPOUNDS:
Acetone, Methanol
n-Pentane, n-Hexane,
Benzene, Methyl Ethyl Ketone,
Dimethyl Amine Ethanol, Methyl Acetate

HYDROCARBONS:
Vinyl Chloride, Methyl Chloride
Methylene Chloride, Ethylene Oxide
Acryonitrite

OTHER GASES & CONTAMINANTS:
Hydrogen Sulfide, Carbon Monoxide,
Sulfur Dioxide, Carbon Dioxide,
Chlorine, Ammonia, Various Freons,
Formaldehyde, Tobacco Smoke

Specifications:

Power Supply: 18VDC (AC adapter supplied)
Dimensions: 3.34"W x 3.34"H x 1.03" D
Output: 0 – 5VDC, representing 0 – 100% air pollution
Operating Temperature: 32 – 140F
Storage Temperature: 10 – 150F
Humidity: 5% - 95% RH (non-condensing)
Sensor: BAPI BA AQS-R-05
Wiring: Unit is supplied with a suitable 18VDC power supply.
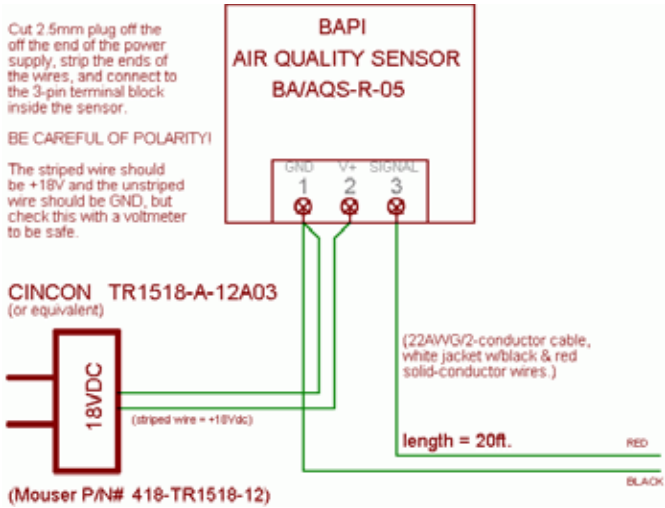
Wiring is simple using 24 AWG solid or stranded wire. Runs can be hundreds of feet.

-48 Volt DC Voltage Monitor

Monitor telephone batteries or cell phone system power with this low-cost sensor

About the size of two dominos, this sensor converts a -48 DC voltage into +5 Vdc signal suitable for the "C123C" I/O ports on a variety of ITW products. Up to three can be attached. If the CCAT interface is used, up to 16 can be attached.

- • Input voltage range: -15 to -60 Vdc
- • Get graphs, see trends of the batteries
- • Receive e-mail, pages on alarms

Designed for telephony battery voltage monitoring and other applications requiring monitoring a negative DC voltage, this sensor monitors voltage via the I/O inputs (3) on a WeatherGoose or SuperGoose.

The output is proportional to the input voltage across its normal operating range of -15 to -60Vdc (see graph); by setting appropriate trip points on the Goose's alarm page, the user can receive an automatic alert to a potentially dead, discharged, or overcharged battery bank based on the battery voltage.

The unit has built-in protection against accidental short circuits and reversed input voltage via internal shunt diodes and a self-resetting polyfuse.

Specifications

Input Range: -15 to -60 Vdc
Output: 0 to 5 Vdc, linear
Accuracy: +/- 5%
Current draw: <20 ma.
Cable to battery: 36", 22 AWG solid
Cable to monitor: 36", 22 AWG solid
Attach: I/O port (C123C)
Enclosure: black plastic box
Dimensions: 3" L x 1.25" H x 0.5" W
Mounting: tie-wrap or Velcro (tm)
WHITE — ground or 0V (positive battery)
YELLOW — -Vin (negative voltage rail, battery)
GREEN — WeatherGoose analog I/O terminal block,"C" terminal (ground)
RED — WeatherGoose analog I/O terminal block, analog input "1", "2", or "3"

Conversion Formula:

(-0.72 x Scale Value) = Battery Voltage. Use this formula to convert the sensor output (0 to 100) to actual voltage. For example, a reading of 60 would correspond to approximately a negative 43.2 VDC.

Battery Voltage
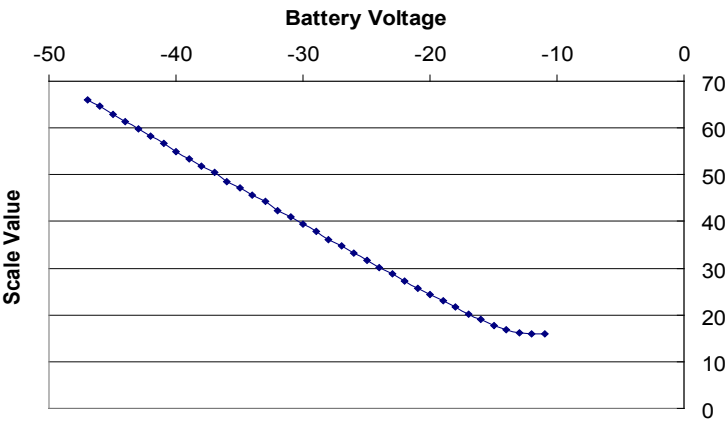
Use this table to translate the output. For example, a -48 volt input to the sensor would be displayed as 66 on the graph. The output is almost linear between 40 and 50 VDC.
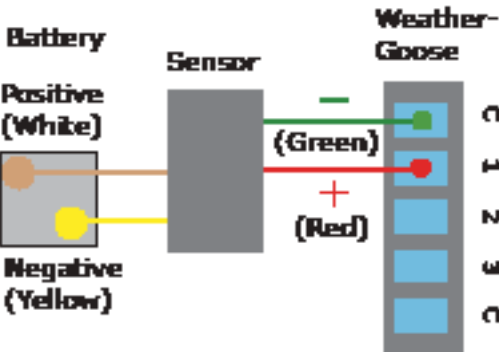
Wiring is simple: ring terminals can be used to attach to the battery. Wiring lengths over 100' can be used.

Serial Bus Interface CCAT - Universal Serial Sensor Interface

Add up to 16 Sensors to WeatherGoose

There are three analog I/O ports (C123C) on a WeatherGoose and, in some cases, this may not be enough in installations where more analog sensors are needed. The CCAT solves this by interfacing the analog voltage signal into a digital signal for use on the Serial Bus.

Up to 16 devices of these devices can be attached to the serial bus. A temperature sensor is an example of a serial bus device. Up to 16 CCATs and other digital sensors can be attached to the serial bus.

A analog to digital converter, the CCAT converts the analog signal into a digital value with a unique digital address. Each CCAT contains two RJ-11 receptacles so that they can be daisy-chained together.

Each end of the CCAT contains an RJ-11 receptacle. The twisted pair receives the analog signal input. A CCAT is almost the same size as a stick of chewing gum. Housing is black shrink tubing.

Multiple Types of Configurations

CCATs can be manufactured pre-configured to what type of device they will monitor:

- Door Sensor (contacts open, closed)
- Water (levels of dampness)
- Current (0 - 30 amps)
- 5,000 millivolt (0 - 5 VDC input)

CCAT Internals

Digital Interface — A/D — Red +

64 bit address — Green −

RJ-11 Jack   RJ-11 Jack
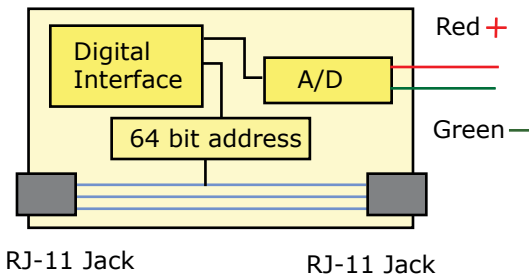
Specifications

Signalling protocol: Dallas Semi "1-Wire"

Maximum CCATs: 16 devices

Response time: 5 seconds

Size: 3" L x 0.6" W x 0.5" H
Connectors: Two RJ-11 receptacles
Wire type: Cat 3 telephone-type wire
Model Number: H922

Aggregate cable length should not exceed 600 feet. The analog signal wire should not exceed 100 feet.

Model Numbers: CCAT - Door Sensor   CCAT - Water
                      CCAT - Current   CCAT - 0 to 5VDC

To avoid home-run wiring, the CCATs can easily be daisy chained using RJ-11 connectors and Cat 3 telephone-type wire.

RJ-11 Jack (Serial Bus on WeatherGoose)

Cat 3 cable

Door Sensor

CCAT

Water Sensor

CCAT

Current Transformer

CCAT

0- 5 VDC
output device

CCAT

to 12 more CCATs
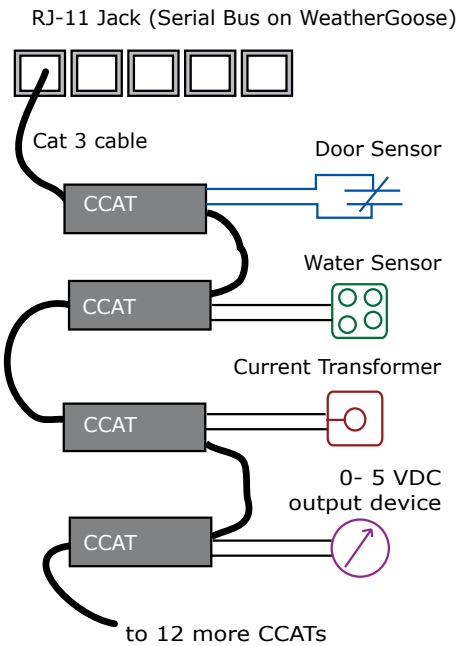
Smoke Alarm

A remote smoke detection and alarm accessory for use with WeatherDuck and WeatherGoose climate monitors.

This kit connects a standard Smoke Alarm with the WeatherGoose, SuperGoose or a WeatherDuck. The SA-1 is wired and assembled, ready for installation.

The Smoke Alarm kit is contains all the parts to get smoke detection up and running fast. A 5-15 power plug connector is standard.

The Kidde Smoke Alarm supplied is powered by 120vac city power and contains a 9vdc battery for backup in the case of power failure.

This type of smoke alarm has a third wire that triggers a group of smoke alarms when one senses smoke. This third wire is used to relay the alarm state to the WeatherGoose. The group relay initiating function of the smoke alarm is retained.

Sensor Wire

Smoke Alarm

WeatherGoose

Supplied power cord

120vac
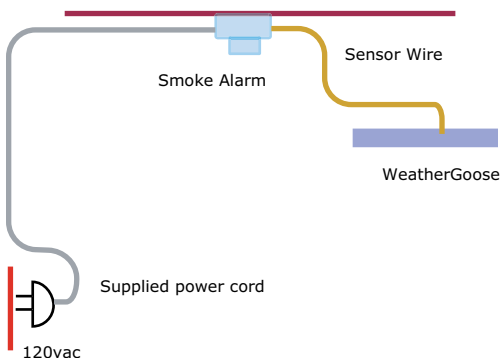
The supplied wiring makes installation easy. Plug the cord into the wall plug; attach the output wires into the WeatherGoose. Test the installation by pressing the alarm's Test button.

Specifications

Model: Kidde 1275, white plastic case (or equiv.)
Buttons: test, reset, hush function
Alarm: buzzer , 85db
Red Indicator: flashes for normal condition
Power: 120vac, 80ma.
Low battery: chirp sound
Interconnection: third wire to other alarms
Connection: direct to C123C ports on WxGoos.
Temp Range: 40F to 100F
Humidity Range: up to 85% RH
Sensor: Ionization
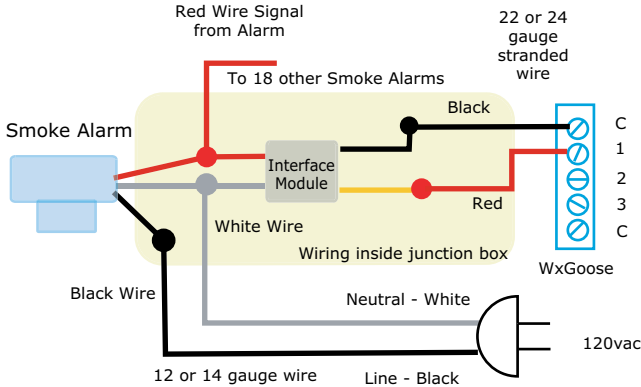
The schematic shows how the Smoke Alarm wires to the interface and the WeatherGoose. Up to three can be directly attached to the three C123C ports on the Gooses and the Duck.

Supplied Parts

SA-1 comes assembled, pre-wired, ready for installation with the following components:

- Kidde 1275 Smoke Alarm (or equivalent)
- Power wire: 30 ft, with 5-15 plug
- Junction box with strain reliefs
- Sensor wire: 30 ft. 24 awg, wire pair.
- Interface installed in junction box.

Installation

The alarm can be easily ceiling or cabinet mounted. When there is no alarm, the I/O port value will be 99. When smoke is sensed, the value is changed to 1. Alarms can be set to create e-mail, paging, and SNMP Trap alerts.

Model Number: SA-1

Video Camera

Low-cost Camera adds Still and Motion Images to WeatherGoose Climate Monitors. Get e-mails and pages when motion is detected.

Video Camera 10/100 Ethernet

Adds Video to Server Room Monitoring

Each WeatherGoose can be configured to operate with the D-Link DCS 950 Securicam by entering the IP address of the camera.

The camera is powered by a small wall transformer and connects to a network as part of a network or sub-net.

Standard Ethernet cables are used and the camera usually connects to a switch or a hub. For set-up, the camera can be directly connected to a PC by use of a crossover cable.

- ▪ Clear color pictures
- ▪ Integrates into WeatherGoose family
- ▪ Built-in Motion Detection and Alarms
- ▪ Still or Motion images
- ▪ Simple Installation
- ▪ Built-in microphone

About six inches tall the D-Link easily adds video to the web pages of any WeatherGoose Climate Monitor.

IP-based, the camera comes with access and recording software as well as integrating into the Weather Gooses

Motion Detection

The user can define three zones for motion detection. If motion is detected an e-mail is sent. This feature is useful in server room monitoring where there are no door alarms.

Both the WeatherGoose and WatchDog Console applications are pre-configured to use the D-Link 950 Camera.

Non-Client (JPEG) or Active-X Environments

Once the address is loaded into the configuration table, the camera is commanded through the camera's API to add a JPEG still image to the WeatherGoose's home page. This method of adding an image does not require the user's Browser to load the Active-X plug-in which is disabled in many IT environments.

If the user wishes to enable the Active-X capability, the camera will produce moving images simply by double clicking on the WeatherGoose Web page.

Camera Specifications

Note that many of the specifications listed below require Active-X plug-in to be enabled. For more information, see http://www.dlink.com.

Remote Management

Configuration Accessible via Web Browser

Record to a Local Hard Drive via Web Browser

Networking Protocols

▪ TCP/IP, HTTP, SMTP, NTP, DNS, DHCP, UPnPTM, DDNS, PPOE Support

Connectivity

▪ 10/100Mbps Fast Ethernet
▪ Auto Negotiation
▪ Auto MDI/MDI-X
▪ Video Algorithm Supported

Hub or Switch

The camera is assigned an IP address and connects to a switch or hub. A static address is necessary for WeatherGoose operation.

WeatherGoose

Camera
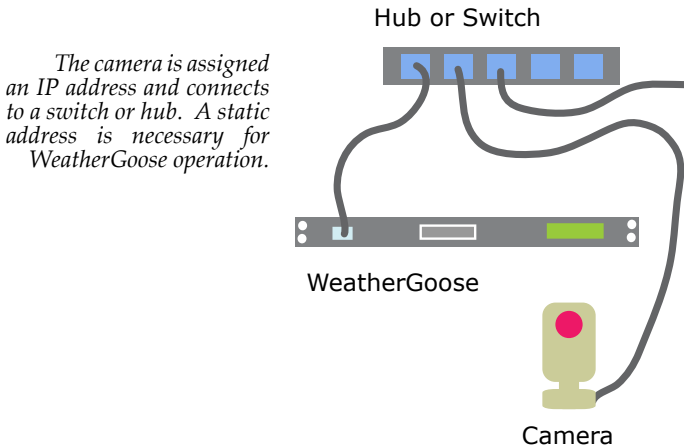
PowerEgg2

Update existing power strips with this power analyzer and remote control. Monitor total power and voltage. Use a standard web browser to reboot either of two in-line receptacles.

In-Line Power Monitor and Remote On/Off Controller

This compact box can upgrade an existing power strip to have complete power monitoring and remote-controlled individual receptacle on/off control. The Egg can be used as a stand-alone monitor or as a web accessed device.

Up to 16 amps can be monitored and controlled with the PwrEgg II. A 5-15 connector is standard. A Weather Goose is required for remote control.

A backlit LCD continuously shows labels and values using a rolling display. Attached to a Weather Goose or compatible Climate Monitor, the power data is graphed, logged, web accessed, and a variety of alarms can be set. Up to 16 Power Eggs can be monitored by a WeatherGoose.

Data provided by the PowerEgg2

Voltage: 85 - 250vac (RMS), 50 - 60Hz, auto ranging.
Current:
    0 - 15 amps (RMS), power cord rating. Relays rated at 12amps each.
Peak Voltage:
    Maximum instantaneous Zero-to-Peak voltage since last read by Weather Goose logger, typically 60 seconds.
Maximum Voltage:
    Maximum RMS voltage since last polled by Weather Goose logger, typically 60 seconds.
Minimum Voltage:
    Minimum RMS voltage since last polled by Weather Goose logger, typically 60 seconds (typically used for brownout detection).
Power Factor:
    Relationship between voltage sine wave and current sine wave, 100% indicates a purely resistive load, any value less indicates a reactive load and the corresponding loss of efficiency. Value displayed is the ratio of the phase difference of voltage and current.

Watts (Real Power, RMS):
    1.5 second integration of the product of instantaneous volts times instantaneous current.
VA (Apparent Power): Voltage (RMS) times Current (RMS).
kWhr (Kilowatt-Hours):
    A non-resettable running total of Watts multiplied by time and divided by 1000. Up to 65,535 kWhr can be measured before the counter rolls through zero and starts over.
Whr (Watt-Hours):
    A non-resettable running of Watt-hours (up to 999). Total energy used is kWhrs plus Whrs.

Other Specifications

Individual Relay Amperage:
    continuous 12 amps, 16 amps starting load for 3 seconds. Total current is limited to 15 amps by plug type. Other plugs are available such as the L5-15.
Indicator Lamps: On/Off for each receptacle.
Receptacle Type: NEMA 5-15.
Plug Type: NEMA 5-15.
Relay Native State:
    Normally On. If power is lost and restored, the relay reverts to On. A web command can return the relay to Off.
Security:
    Three levels of password protection are available via the Weather Goose or Super Goose.
Connection to WeatherGoose:
    Dual RJ-11 type connectors using Cat 3 cable or equivalent. Aggregate cable length of 600' can generally be used. Six conductor non-crossover splitters can be used.
Model Codes:
    PwrEgg II - 5-15.
    PwrEggII - L5-15

Multiple Power Eggs can be daisy-chained together using the two RJ-11 receptacles via Cat 3 wire. The signalling method used is Dallas "1-wire" which is used on a variety of other remote sensors on the WeatherGoose or compatible devices.

PowerEgg3

A small box that allows for dial-up control of up to four power receptacles, PowerEgg3 is useful for retail stores or kiosks where electronic devices may need occasional rebooting.

Remote Power Control Over Telephone

- ▪ Dial-up telephone access
- ▪ Four controlled receptacles
- ▪ Internal modem, 2400 baud
- ▪ Setting change confirmation
- ▪ Low cost, simple to install
- ▪ Total current and voltage displayed
- ▪ Simple control commands

The PowerEgg3 can be rack- or wall-mounted. Simple keyboard commands control four receptacles. Password protected with up to four user names. (Picture shows prototype unit.)

Remotely Restart Four Devices

A standard dial-up voice telephone line can be used to remotely power-off and power-on devices. Using a PC with almost any serial data client software such as HyperTerminal (tm), an remote user can individually control up to four receptacles.

This device is useful for retail stores or kiosks where electronic devices need occasional rebooting from a remote location. The total current and individual consumed by the four receptacles is reported along with the voltage. The unit can be ordered with 1,2,3 or 4 receptacles.

Each Power Controller and each receptacle can be give a friendly name. Each Controller is factory assigned a unique 64 bit address at time of manufacture.

Two levels of password protection are provided: four users and an administrator. The user password permits power cycling and the administrator can assign privileges to each user. Each user can be assigned rights to control any given set of receptacles, or all receptacles.

Specifications

Voltage range:	100-280 vac, 50-60 Hz
Dimensions:	8.5″ W x 1.75″ H x 6″ D
Case:	Steel, 18 ga., black
Current:	15 amps total
	10 amps per receptacle
Plug:	IEC C13
Receptacles:	IEC C14, Four, maximum
Power used:	2 watts
Modem jack:	RJ-11
Signalling protocols:	V22bis 1200 baud
	V22 1200 baud
	Bell 212A 1200 baud
Approvals:	Relays UL listed
Indicator lamps:	Power on (green)
	Data connect (green)
Power cycling:	Relays go to On upon power On

Current measurement:	0-15 amps, RMS
Voltage measurement:	0 - 300 volts
Voltage values:	Peak (last 5 seconds)
	Low (last 5 seconds)
	Present value
Current (amps) values:	Peak (last 5 seconds)
	Low (last 5 seconds)
	Present value

Power Controller Elements

Power Outputs (4)
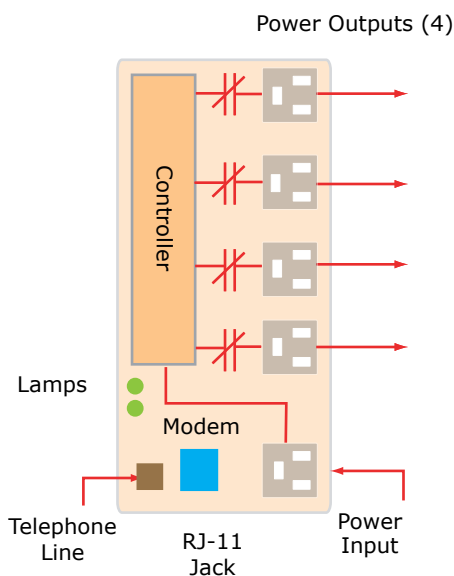
Using simple text commands each receptacle can be turned on and off. The total current consumption and voltage can also be determined.

Controller

Lamps

Modem

Telephone Line

RJ-11 Jack

Power Input

Passwords

Passwords:	Four Users
	One Administrator
	10 characters each password
User privileges:	individual receptacle control power
Admin privileges:	set passwords
	set friendly names
	set site name

Control and Administration Functions

HELP MENU:
   'H' Help menu 'X' Hang up modem
Power measurement:
   'S' Power status 'W' Max power
   'V' Voltage   'C' Current
   'A' Max current 'E' Min/Max voltage
Power control:
   'Nn' Power/Outlet# ON
   'Fn' Power/Outlet# OFF
   'Rn' Reset/Outlet (OFF-ON)

113

Admin:
 'T' Site name
 'Mn' Outlet name/Outlet#
 'D' Set admin password
 'Kn' Set users outlet access
 'In' Set idle timeout (1-5 min)
 'Yn' Set number of rings (1-9)
 'L' Show log
 'Pn' Set protocol (changes on next call):
   ▪ Bell 212A (1200)
   ▪ V.22 (1200)
   ▪ V.22bis (2400)
Controls: Power switch
   Reset to default push button

Model Number: PowerEgg3

The front panel of contains the RJ-11 telephone line jack, the power and line-connected indicator lamps and a reset push-button. If the button is held down for 15 seconds, the default settings are restored.

Installation
1. Plug in all devices
2. Plug in power
3. Check to see if Power Indicator is green (on)
4. All devices should power on.
5. Run HyperTeminal or other serial modem client communications.
6. Type "atdt 512-555-1234" using the telephone number of the remote site.
7. Type "F1" to see if receptacle #1 turns off. If so, type "N1" to turn the receptacle back on.
8. Type "H" for list of commands and options.

Wiring is simple; connect the power and a telephone line and the PowerEgg3 is ready for operation.
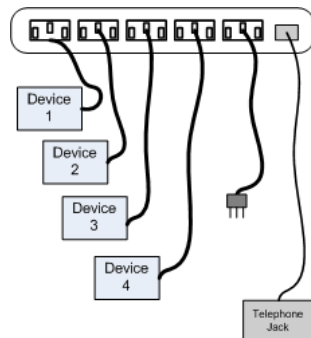
TempRat

Easy to install, the TempRat fits into a 1-U rack or cabinet space and continually shows temperature. A 12 foot remote temperature probe is included.

Temperature Monitoring

Built to give the IT manager an inexpensive view of the hottest spot in a server room or blade server cabinet, the TempRat continually displays degrees F and C. There are no controls to operate or adjustments to make. When the batteries are installed, the TempRat starts indicating temperature.

The TempRat inexpensively shows how hot the inside of a cabinet has become. Install the mounting screws, position the temperature probe and observe the readings. Celsius and Fahrenheit readings are constantly cycled. No external power supply or other support device is needed, and batteries should last more than a year.

Specifications:

Sensor:
   Dallas/Maxim 18b20 semiconductor temperature sensor.

Accuracy:	+/- 0.5 degC
Battery type:	AA, two required
Cord length:	12 feet with two mounting clips
Cord connector:	RJ-11
Battery life:	More than one year. Low battery warning
Temperature range:	-40F to +50F
Temperature display:	hundreds, tens, units, F/C
Display:	LCD, 1.5" x .75", black on green

Mounting:
   1-U rack or 1 metal box (3.5" x 3.5" x 2") with adjustable mounting ear drilled for rack screw spacing mount, black wrinkle paint

.Model codes:

TTM-R-12 Rack mount, 12' cord.
TTM-B-12 Box mounting, 12' cord

Variable Speed Fan Controller

Noisy, power consuming fans? This self-contained fan controller keeps dense cabinets cool and quiet.

Proportional Control of Cabinet Fan Speed

The Fan Controller proportionally adjusts cooling fan speed based on temperature which results in a much quieter cabinet environment and power savings. Reducing fan speed by half can reduce noise by 70% and greatly increase fan life.

The front panel shows the Ethernet connection, back-lit LCD display, and the manual set point knob. The rear panel contains two power inputs and three power outputs. A push button is also provided to silence the internal audio alarm.

With proportional control, the fans run at the speed required to maintain a selected temperature. If the cabinet gets hotter, the fans run faster. If the cabinet temperature sinks to a colder level, the fans will shut off completely. Conversely, if the cabinets heat up to where the temperature exceeds the selected value, the fans will run maximum speed.

The selected value is called the set point. See the control graph on the next page for the range of proportional control.

If the temperature is less the Controller ramps the fan speed down to a minimum of 30% of the fan's full speed rating to avoid intermittent blade stalling called "cogging."

Self-Contained, Rack Mounted

The Controller is self-contained; no other equipment is required. The user supplies only the fans and power cords.

Power is applied to two receptacles and delivered to the fans via three plugs. The input power has automatic A-B switching. Fan loads of up to 8 amps can be controlled. IEC-style connectors are used.

Controls are mounted on the front panel, power is accessed through the back panel

Local or Web Control

The user normally adjusts the set point through an Internet connection. If the Internet connection is not available the user can manually adjust the set point. An internal web server is included in the Controller.

The user controls the temperature set point through an Internet connection. If the Internet connection is lost, the Controller automatically reverts to the last Web-set set-point.

Fan Speed Controller Elements (Top View)
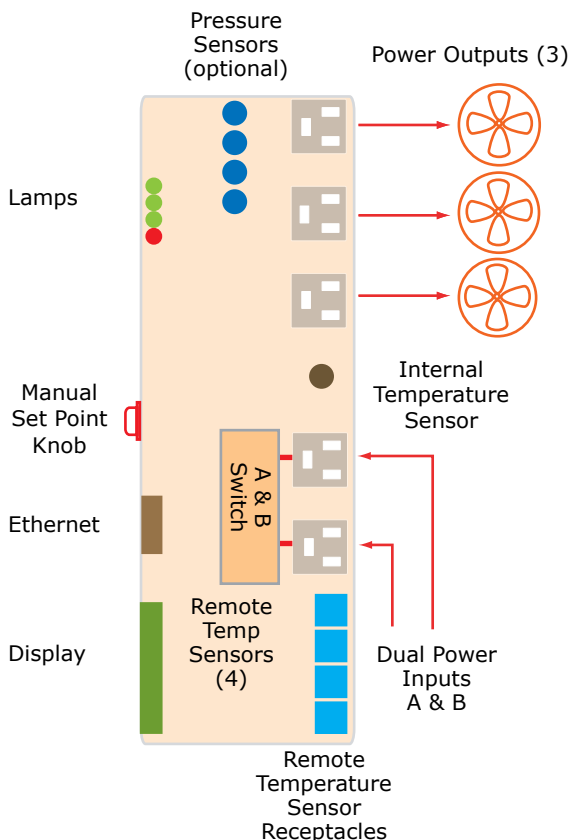
All of the components are internal to the Controller. The power connections and optional pressure sensors are on the rear panel. The controls and display are on the front panel.

Internal or External Temperature Sensing

A temperature sensor is mounted in the front of the cabinet. Additionally, four front-mounted receptacles permit four remote temperature sensors to be added. When these sensors are installed the Controller automatically selects the hottest sensor and controls the fan speed from that sensor.

This permits an installer to attach sensors to a variety of locations in a cabinet and see which area runs at the hottest temperature. The sensors can be mounted up to 20 feet from the Controller.

Web Access, E-Mail, SNMP Alerts

Each Controller is assigned an IP address. By browsing to this address, the user can adjust the temperature set point, set alarms and see graphs of

the cabinet temperature values. No client software is required, only an Browser, such as Internet Explorer or Firefox is need to access the data and the graphs.

A full SMNP MIB is included so that the Controller can be integrated into a Network Monitoring System such as HP OpenView, Nagios, or MRTG.

Solid-State Power Control

A solid-state power control varies the power to the fans. Voltages of 120, 208, and 230 can be used - voltage sensing is automatic. Overload protection with a fast-acting 8 amp circuit breaker is included.

A-B power switching uses conventional power relays. If one power source fails, the other power source is brought on-line in less than 5 seconds. After the switch-over, the fans go to full speed for 5 seconds, then return to the previous setting.

Either permanent split capacitor or shaded pole fans can be controlled.

Porportional Control
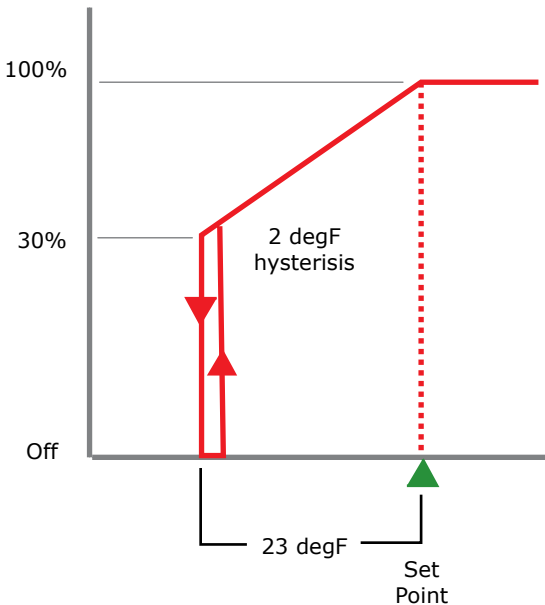
At temperatures above the set point, the fans will be full on. At temperatures below 23 degF below the set point the fans will be full off. There are 23 increments of fan speed between full on and the lower limit of 30% on. The 2 degF difference (hysteresis) of increasing and decreasing temperature prevents hunting.

Indicators, Alarm Horn and Controls

While the Controller is designed for Web control and access, manual controls are included. Indicator status lamps, a manual set-point control knob, and a back-lit LCD display permit the user to see the operating conditions without an Internet connection.

An internal alarm horn can be set to alert the user to any conditions requiring immediate attention such as persistant over-temperature or failure of a remote sensor. A local push-button silences the alarm.

Optional Battery Backup

A battery back-up feature can be added. This permits the controller to remain in operation for eight hours if main power has been disconnected. This gives the Controller time to notify the user that line power has been lost. The battery only supports the control electronics, not the fans.

All data, alarms and configuration is presented in graphic, easy-to-under-stand HTML pages. All data values are graphed.

Optional Pressure Sensors

In installations where confirmation of fan rotation is required, up to four pressure sensors can be installed to measure positive air pressure created by the fans blowing. Plastic tubing carries the air pressure to the sensors. Failure of air pressure can be alarmed.

Hardware Specifications

Power Connectors

Input: two IEC C-14 plugs
Output: three IEC C-13 receptacles
Range: 90-264VAC, auto-sensing, 50-60Hz,
Load: 8 amps, total for all three outputs

Ethernet Connector

Ethernet data: RJ-45

Indicators: data and link
Speed: 10/100, auto detect

Fan Control
Fan start: full speed, 1 second, then control speed
Fan speed control: 30 to 100%
Hysteresis: 2 degF (see chart)

Temperature Sensing
If remote sensors are connected, the Controller automatically selects the hottest sensor for use as the control variable.
Internal sensor range: 32-125 deg F
External sensors: up to four supported
Connector: RJ-11, four
Cable length: 12 or 20 feet
Hottest sensor detect: automatic

Local Display (LCD)
Display: 2 lines x 8 characters, scrolling
Lighting: backlit
Values displayed: Remote Set point: degF
                          Fan speed %
                          Internal Temperature: degF
                          Remote Temperature: degF
                          Override: 100% fan speed

Local Set Point Knob & Push-button

Knob: Black, with scale markings
Range: 65-100degF
              Max Clockwise: fans On (100%)
              Max Counterclockwise: fans Off
Push-button: 1. manual override
              2. horn silence

Manual Over-ride Conditions Logic
The primary control method is through the Web interface which is referred to as Remote Control and has three states:

        Local Emergency (Manual Mode):

                1. Depress push-button and

                2. Rotate knob full clockwise.

                3. Fans go to Full On.

                4. Only Full On is available.

        Local Over-ride (Local Mode):
                1. Disconnect Ethernet cable
                2. Set knob to desired set point
                3. Manual set point is active

        Web Control (Automatic Remote):
                1. Power fails
                3. Last set-point is stored
                2. Power restored
                4. Operation resumes

Indicator Lamps, Horn & Push-button Control

Speed (green): Fan speed in proportional range (not 100%)
Fan Manually Off (green):   1. No Internet connection,
    2. manual Off
Remote control (green): Internet control (normal)
Fan full on (red):   1. Over temp condition or
    2. Manual over-ride
Horn (76db): 1.Out-of-control alarm (over temp), or
    2. No temp decrease for 5 minutes.

Pressure Sensing (optional)

Sensors: analog barometric
Range: 0 - 100 mmHg
Fitting: 0.09-0.1"ID tubing, press-on

Physical

Mounting: 1U Rack mount, 8" deep
Height: 1.73"
Width: 17" without brackets
Depth: 4" maximum
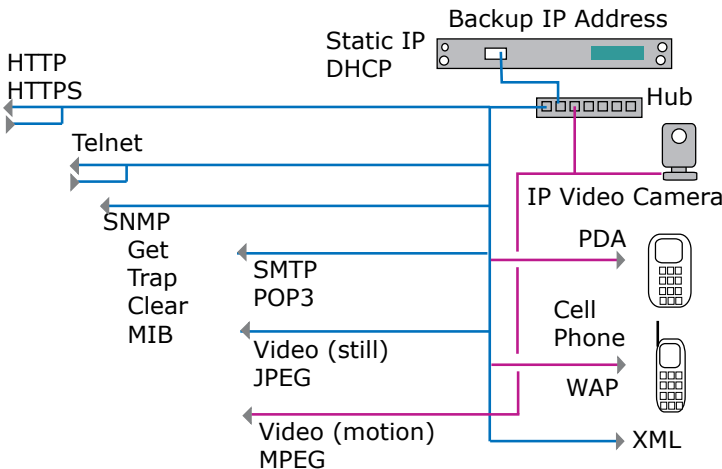Brackets: 2 detachable recessed mounts
Panel mounting brackets: optional
Color: textured black

Software Specifications

The Controller is easily configured and managed though its internally-generated web page. No client software or external software is required.

A number of protocols can be used to access the data on the Fan Controller. A video camera option is also available.

Graphs and real-time data as well as e-mail alerts at user specified set-points/thresholds are supplied.

Additionally, all data can be exported to into CSV or Excel files for storage or analysis. ITW's WatchDog Console is also available for multiple Controller monitoring from one PC.

General Features - Access Protocols

Most protocols can be disabled if desired (exceptions: HTTP or HTTPS must be enables or the unit cannot be controlled).

For most protocols the user can set the TCP/IP port number.

The following protocols are supported:
HTTP and HTTPS (HTTP/SSL and HTTP/TLS)
SNMP (trap and get; no set)
SMTP/POP3
FTP
TELNET (airflow adjust, reboot, prog. CCAT)
ICMP (ping)

Most device data is available in the following formats:

HTML (human-readable)
XML (machine- and human-readable)
PDA (HTML specially formatted for hand-held devices)
WAP (variant of HTML for mobile phones)
CSV (Excel- and database-readable log data)
SMNP
Tabs (same screen format as RSE)
Data Displays (existing tab, new values):
Local Set Point Temperature: 65 to 100degF (knob)
Current Temperature (hottest temp sensor)
Current Remote Set Point value
Set-point Mode: Manual over ride or automatic
Internal sensor: present temperature
Remote sensors 1, 2, 3, 4, 5 values
Pressure values: sensor 1, 2, 3, 4 (if installed)
Alarm horn: On or Off
Battery back-up: On or Off

Additional user-configurable device information:

Location (e.g. building, floor, room, cabinet)
Contact name (for the administrator)
Contact phone number
Contact e-mail address

Control Tab

Select an action via drop-down box to be carried out on the selected action:
Place all fans in Full Power mode
Place all fans in Off mode
Run mode:
     Automatic Local
     Automatic Remote
     Manual Mode

A separate configuration screen changes the friendly name on a per-outlet basis.

Alarm Tab

Alarm conditions:
Over-temperature (over set-point condition)
Unit placed in Manual control (local over-ride)
Pressure sensor reads low
Battery backup enabled
Remote sensor unplugged
Consistent over-temperature operation

Event Log

The event log is a web-viewable textual log, available via XML, with a timestamp that is available across all ITW units.

Even when time is not configured there still is a timestamp available in the log.

Log size is capped by an internal limit, and old log entries are dropped. The following events are logged, with detail as appropriate:
Alarm condition entered or exited
Remote sensor unplugged or plugged in
Severe errors on 1-wire bus (more than "normal")
Errors sending SNMP traps or email (SMTP and POP3)

Configuration Tab

The user authentication function allows for three types of accounts:

▪ *Read-Only* enables user to see current sensor values and retrieve data in various formats (listed above). User can see the values of some configuration parameters but cannot change them. Some screens are completely blocked.

▪ *Fan Manager* is given the same privileges as the Read-Only user plus full access to the Control page for control and configuration of fan controller as described above but is not allowed to change basic device configurations such as alarms and network access.
▪ *Administrator.* Unlimited access.

Any account may be left blank to indicate that no username/password is required; however, an account may not be left blank if a password exists for a lesser account.

For example, if the Administrator account is freely open, Read-Only access cannot be username/password-controlled.

Any account may share duplicate usernames/passwords with other accounts. For example, the same username/password may be used for both Fan Manager and Administrator.

In this case, the user is given the greatest amount of access; the more permissive account trumps the less permissive account. This feature allows users to maintain Read-Only and Administrator accounts without special requirements for a Fan Manager.

Agency Approvals

UL/cUL listed 60950, Information Technology Equipment.

The front panel shows the front and back connections. In this unit only two power outputs are shown: three are normally supplied. Also, this unit has only one jack for remote temperature sensors, four are normally supplied.

Weatherbat-1

A web-based climate monitor for internal cabinet mounting in empty cabinet spaces or corners that includes a full sensor set with no supplemental client software required.

Internal Cabinet Climate Monitoring

Available with or without a metal housing, the small WeatherBat circuit board contains six internal sensors and a built-in Web server. Power is 6vdc. Up to 16 optional external sensors may be added. The optional webcam is mounted remotely.

Designed specifically for internal computer cabinet installation, this low-cost self-contained unit continually monitors climate via an internally-generated web page or SNMP. Values are graphed to see trends. The web display can be quickly branded for OEM company logos and names.

The WxBat-1 is shipped without a sheet metal housing: the 1.5" by 4.75" circuit card is designed for use with custom sheet metal enclosures for computer cabinet mounting. No sheet metal is supplied.

ITW can supply custom sheet metal, if required, to mount in customer-specified cabinet space. Four mounting holes accommodate snap-in or stud-mounting methods.

All software is contained inside the unit. The user supplies an Internet connection and an IP address. Administration of the unit is accomplished via the web page. When user-defined thresholds are exceeded, alarms can be sent via e-mail, or SNMP trap.

A full set of internal sensors is included:

Temperature	Humidity	Air Flow	Light
Door Position	Sound	Webcam(ext.)	

A variety of remote sensors are easily added. Up to 16 remote sensors can be added using Category 3 telephone wire and RJ-11 connectors. Remote sensors include:

Air Flow/Temperature	Current (ac amps)	Power
Temperature	Humidity	Motion

Remote sensors allows the unit to monitor up to 16 cabinets hundreds of feet distant or show the status of air-conditioning outputs. There is one

remote sensor jack on the unit. Simple splitters are used to expand device to use all 16 sensors.

Software protocols supported by Weatherbat include:

Web (HTTP)	SMTP/POP	SNMP (full MIB)
FTP (firmware upgrades)	Graphing	PDA display format
WAP (cell phone display)	XML	Excel™

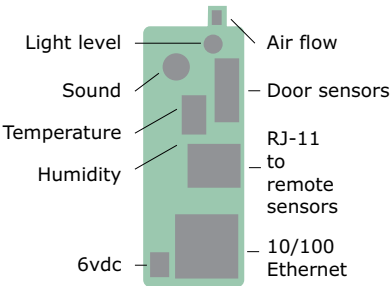The web cam used is an IP-based Axis 205 that can be installed locally or remotely.

Firmware updates are made using standard FTP file transfer, eliminating factory upgrade returns.

A web page displays the current values with graphs showing trends. The web cam image is JPEG format. The data can be viewed on a PDA and cell phone. The unit is configured via the web page. The web page can be quickly configured to specific logos and brand names.
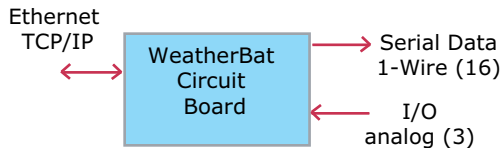
All connections are made through the front panel. No client software or installation CD is required.

The user connects an Ethernet cable, sets the IP address and begins using the unit. An LCD constantly displays the sensor values.
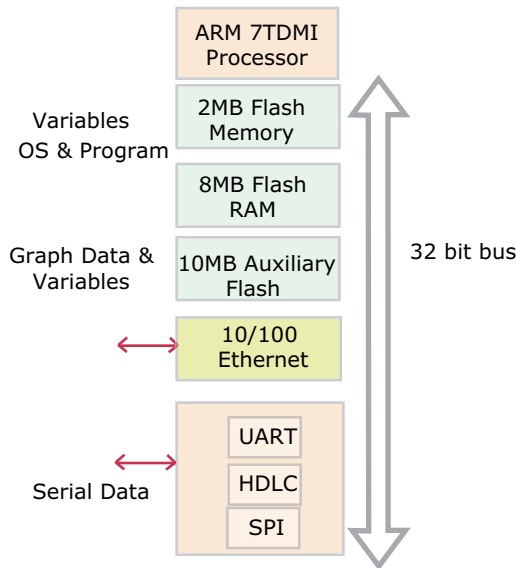

Light level — Air flow
Sound — Door sensors
Temperature
Humidity — RJ-11 to remote sensors
6vdc — 10/100 Ethernet

129

Minimum order is 100 units.   Start-up fees apply depending on the level of customization required. Delivery time is about four weeks.

Three Ports, Ethernet, Analog, Serial

Ethernet
TCP/IP

WeatherBat
Circuit
Board

Serial Data
1-Wire (16)

I/O
analog (3)

A web page displays the current values with graphs showing trends. The web cam image is JPEG format. The data can be viewed on a PDA and cell phone. The unit is configured via the web page. The web page can be quickly configured to specific logos and brand names.

ARM 7520 Processor Features

ARM 7TDMI
Processor

Variables
OS & Program

2MB Flash
Memory

8MB Flash
RAM

Graph Data &
Variables

10MB Auxiliary
Flash

32 bit bus

10/100
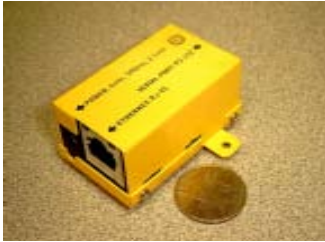Ethernet

UART

HDLC

Serial Data

SPI

All connections are made through the front panel. No client software or installation CD is required. The user connects an Ethernet cable, sets the IP address and begins using the unit. An LCD constantly displays the sensor values.

WebFoot WF-1

Low-cost, easy-to-install ethernet-to-serial adapter for access to serial device data via the Internet.

Internet-enabled Serial Devices

WebFoot provides easy and low-cost access to serial device data via the Internet. No programming or equipment modification to existing devices should be necessary. Devices using the RS-232 protocol can be quickly Internet enabled. A typical application is IT WatchDogs' WeatherDuck Serial Port Server Room Climate Monitor being directly Internet accessed.

The WebFoot is shown next to a US quarter for size comparison. The user attaches an Ethernet cable, power supply, and a serial device, such as a WeatherDuck. The small tabs provide an easy attachment points for walls or brackets; no special mounting considerations are needed. The metal case is powder-coated for durability.

The adaptor is a pass-through device. TCP/IP data is converted to serial data and is passed to and from the serial port. There are two general applications: internet-addressable devices and redirected serial port.

In the first case, the device is accessed by an Internet Protocol (IP) address from the user's application program. In the second case, existing programs that access serial ports (COM) use supplied redirector software. Applications seeking data from a serial port will be redirected to an IP address. This redirector may allow existing serial port programs to use remote or local Ethernet connections to retrieve data without modifications to the application program.

The WebFoot contains a factory-set Media Access Control (MAC) address. The user sets the IP address or has one assigned on the subnetwork by the gateway or the router.

There are three connectors: a power receptacle, a DB-9 plug (male), and an RJ-45 receptacle. Power requirement is 6 volts direct current at 300 milliamperes.

Small mounting tabs are provided for the device to be mounted to a wall or bracket.

Static or Dynamic IP Addressing

Upon power being applied the WebFoot immediately sends a Dynamic Host Configuration Protocol (DHCP) request for a leased address from a DHCP server if one is available.

DHCP is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP automatically assigns IP addresses, delivers TCP/IP stack configuration parameters such as the subnet mask and default router, and provides other configuration information such as the addresses for printer, time and news servers. If no DHCP service is available, the unit can assigned a static IP address using supplied discovery and

configuration software. The static IP address set into the WebFoot remains stored when power is removed.

Pin Connections

The RTS and CTS pins are held in a "high" state (+6 volts) in order to supply power to serial port powered devices such as the WeatherDuck. Pin assignments are as follows:

Pin			Function	WF-1 Setup
1	DCD		Data Carrier Detect	Not used
2	RXD		Receive Data	Enabled
3	TXD		Transmit Data	Enabled
4	DTR		Data Terminal Ready	Not used
5	GND		Signal Ground	Enabled
6	DSR		Data Set Ready	Not used
7	RTS		Request To Send	Set High
8	CTS		Clear To Send	Set High
9	RI		Ring Indicator	Not used

Specifications

Serial Interface
Protocol:	RS-232
Data Rates:	50 to 230 kbps
Characters:	7 or 8 data bits
Parity:	odd, even, none
Stop Bits:	1 or 2
Control Signals:	CTS, DTR (set on)
Flow Control:	Hardware, software, none

Network Interface Protocols:
Ethernet 10Base-T or 100Base-TX (Auto-Sensing), full- or half-duplex

RJ-45 Connector Protocols:
TCP/IP, UDP/IP, ICMP, Telnet, DHCP, BOOTP, HTTP, and AutoIP

Indicators (LED)
- 10Base-T connection
- 100Base-TX connection
- Link & activity indicator: Green and orange lamps show link and data status respectively

General Specifications:
Input current:	300 mA
Power Receptacle:	2.1 mm, center positive
Wall Transformer:	UL and CE listed, 6vdc@300ma.

Environmental parameters:
- Operating: -40° to 85°C (-40° to 185°F)
- Storage: -40° to 85°C (-40° to 185°F)

Dimensions:	1.3 x 2.5 x1.05 inches
Mounting:	two sheet metal tabs
Weight:	8 oz.
Color:	Yellow (PMS 432), gray lettering
Specification date:	November 19, 2003
Model Number:	WF-1

Hardware Supplied:
- WebFoot WF-1 with wall transformer power supply
- US 5-15 plug

Software supplied:
Serial port redirector and Discovery/Configuration on CD

General Features
- Small size, simple installation
- 10/100mpbs Ethernet
- RS-232 serial port
- Automatic discovery software
- IP configuration software
- DHCP enabled
- Stored static IP address
- Serial port redirector software
- $179

The housing is 18 gauge aluminum, powder coated. Standard DB-9 fittings are used to connect the serial cable or device.
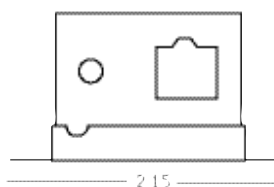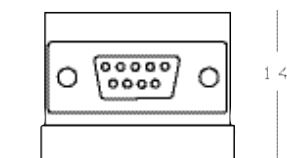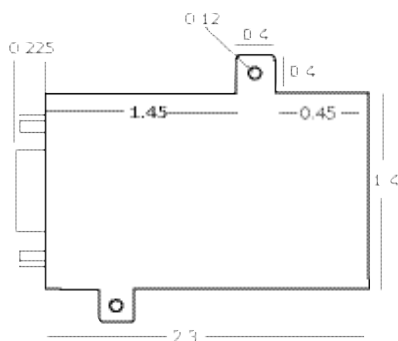
Installing WeatherGeese

Instructions for installing and maintaining Weather-Goose series devices

Using the Data Ports

Analog I/O Ports

Provides 3 analog inputs that are read by the unit. The port is labeled "C123C". The C ports are for the common lead of the analog inputs.

The "123" ports are for the positive leads. Instructions for hooking up analog inputs can be found in the Troubleshooting section.

These show up as IO-1, IO-2, IO-3 on the unit's webpage. These can be given friendly names that correspond to what is attached. Some units do not
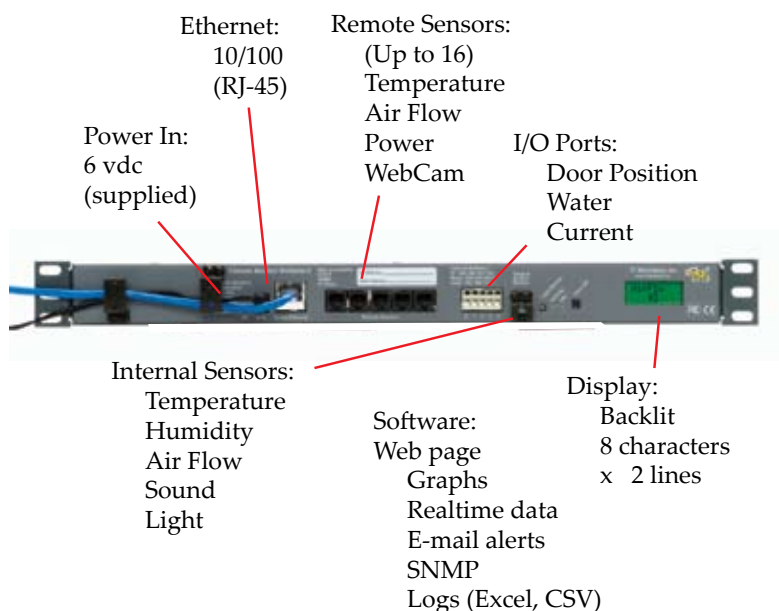
Ethernet:
10/100
(RJ-45)

Remote Sensors:
(Up to 16)
Temperature
Air Flow
Power
WebCam

Power In:
6 vdc
(supplied)

I/O Ports:
Door Position
Water
Current

Internal Sensors:
Temperature
Humidity
Air Flow
Sound
Light

Software:
Web page
Graphs
Realtime data
E-mail alerts
SNMP
Logs (Excel, CSV)

Display:
Backlit
8 characters
x 2 lines

Figure 1 - Front of a SuperGoose

have I/O ports.

Sensor Ports

This is a set of 1 to 5 inputs jacks (RJ-11) for 1-wire sensors. Using the appropriate splitters up to 16 sensors can be attached to the unit. The unit automatically detects the attached sensors and provides you with correct data for each sensor.

LCD

This is an option on certain units. Sensors chosen on the Logs page are displayed on the LCD.

Buzzer Reset

This allows you to silence the buzzer, on unit with this option.

Setup

For the initial setup of the Goose it is recommended that you connect the Goose directly to a local system, instead of trying to reach it through a network. The following steps will guide you through making initial contact with the unit.

Connections

1. Power the unit using the supplied power supply.

2. Ensure that the green power indicator is on. Soon after powering on, the green Ethernet status indicator will blink three times.

3. Connect the unit to a local system using a cross-over cable.

4. The orange Link indicator will turn on if a good link has been established. If the indicator does not light, then check the connections and/or try a new cross-over cable.

5. The unit has now been connected to a local system, it is time to setup the network card, so that the system can communicate with the unit.
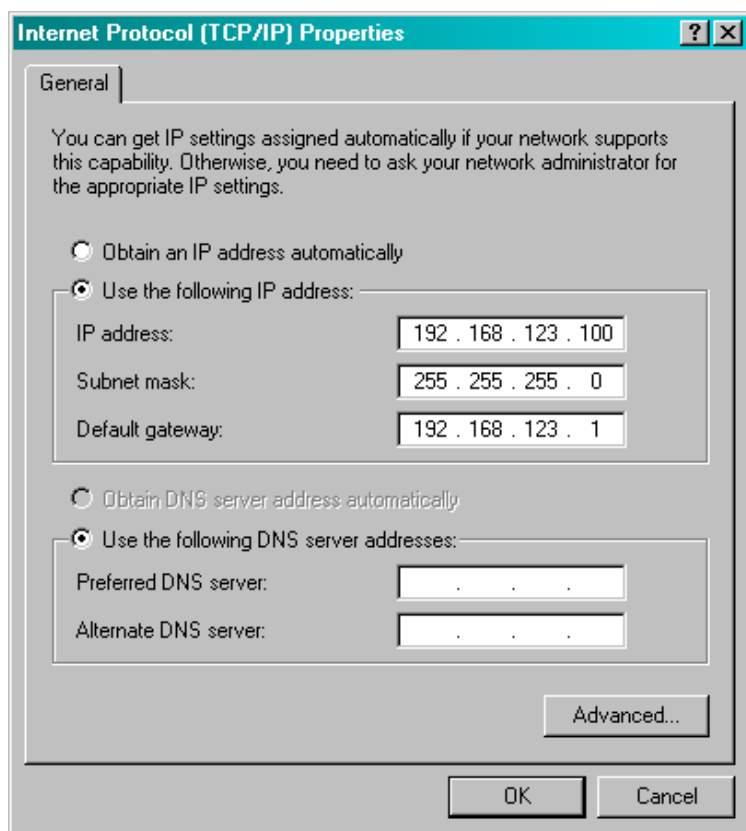
Figure 2: NIC Settings for Unit at Default IP

NIC setup

To connect to the Goose, the network card setting on the computer need to be adjusted. The steps below will guide you through changing the network settings in Windows XP.

1. Click on the Start button.

2. Select the Control Panel. If the control panel is not an option you may need to choose Settings -> Control Panel.

3. Click on the Network Connections icon.

4. You should now see one of more icons that represent network cards installed on your system. Choose the network card you connected the Goose to and right click it and select Properties.

5. Find and double-click Internet Protocol (TCP/IP).

6. This opens a window that shows your current network card settings. It should like similar to the window shown in figure 2. Make a note of the current settings, so that they can be restored later.

7. Ensure that "Use the following IP address" is selected and enter the following settings in the appropriate fields.
    IP Address: 192.168.123.100
    Subnet Mask: 255.255.255.0
    Gateway: 192.168.123.1

8. You can leave the DNS fields blank. Click the OK button on the TCP/IP window to save the changes. Then click OK on the Local Area Connection window to finalize the process.

Connecting to the Goose

Once the network settings have been adjusted you can connect to the unit using a browser.

1. Open a web browser.

2. Type in http://192.168.123.123 in for the address.

3. You should get a screen that looks like figure 3.

4. If so, you are able to connect to the Goose. To configure the IP address on the unit, refer to the Configuration tab section.

Tabs Overview

Sensors

This is the main screen. Here you can see the current values for the sensors that are attached to the unit. For each device there is a graph that shows trends in the data.

Logs

On this screen, you get a graph for a selected group of sensors and a certain time frame. You can also download log data from this page and set the logging frequency.

Display

Use the display tab to change the default names of the devices. On this page you can also see devices that are unplugged or unavailable. You are given the option of removing them from memory. On the display page, you set the temperature unit.

Alarms

Figure 3 - Main Goose screen

The alarms tab lets you set the range of acceptable values for a sensor. You select the method the unit will use to notify you if the sensor goes outside of this range. There is also an option to send test alarms for each sensor. An event log is also included on this page that keeps a record of log messages from the Goose.

Control

This tab provides the interface to elements that can be controlled by the Goose.

Configuration

The configuration tab is used to configure the main features of the Goose, including email, SNMP, user accounts, and an IP camera.

Sensors Tab

Current readings

The current values for each sensor are displayed on the Sensors page. These are updated automatically every 60 seconds. For a faster update hit the Refresh button on your browser. Sensors are grouped together by device. Only devices that are currently available will show up on this screen.

Unplugged devices will not. The internal sensors are displayed in the first box, with the other device boxes following.

Graphs

In each device box, there is a line graph, showing the trend of the sensors for that device. The colors on the graphs match with the color box next to each sensor. If a sensor does not have a color box next to it, then it will not be graphed. The X-axis shows time and the Y-axis shows value. The value axis and time axis will change scale to keep the graph data within the graph window.

Alternate Formats

The Alternate Formats links are used to get information from the Goose in a variety of formats.

PDA: A small version of the Sensors page, used on PDA's and cell phones, designed for screens as narrow as 240 pixels.

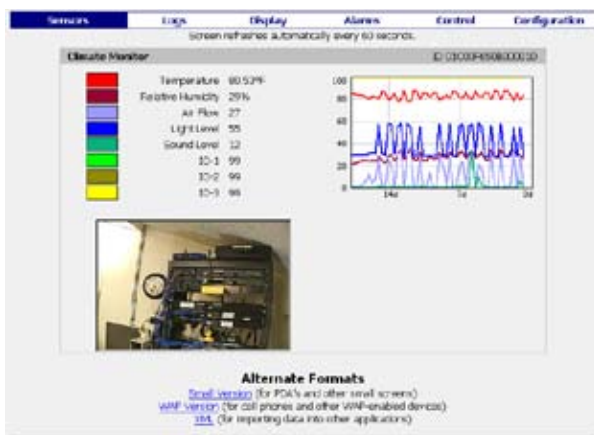**WAP:** A special version of the Sensors page, used by WAP-enabled cell phones.

Figure 4 - Sensors Tab

XML: The current data, along with device information, displayed in XML.

MIB: Check on this link to download the MIB for the Goose. Used in SNMP.

Camera Image

This is an image provided by a supported IP camera. It will be found inside the first device box. It will only appear if a camera has been configured on the Configuration tab. The image is updated every 20 seconds or when the page is updated.

Logs Tab

Graph

On the Logs Tab is a set of controls for the Logs graph. You can select sensors and the time span to use for the graph. The Y-axis shows the sensor values and the time is shown on the X-axis. The legend at the bottom of the

graph provides the sensor name for each color used on the graph. On the left side of the screen is a series of checkboxes, one for each sensor.

To graph the sensor, make sure its box is checked. Use the Time range drop-down above the graph to adjust the time range for the graph. Click on an Update Graph button to get a new graph, when a change is made. On a unit with a LCD display the checkboxes also control which sensors will be displayed on the LCD.
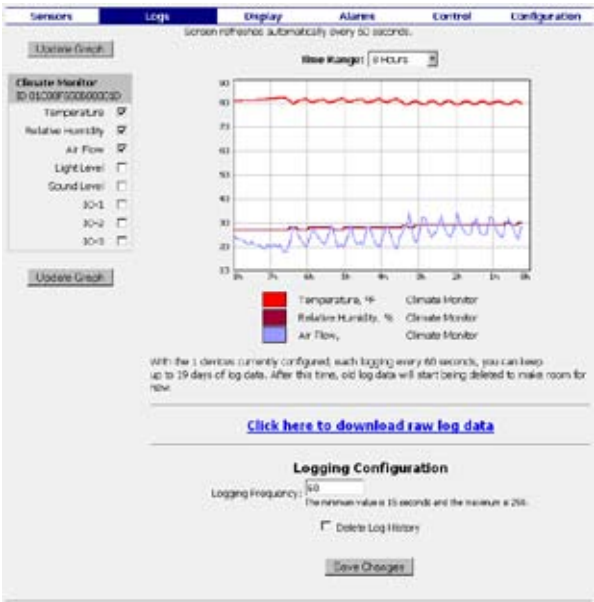
Download Logs

Figure 5 - Logs Tab

To download the log history, select the "Click here to download raw log data" link. The log file is in CSV format and will be called "log.csv". This download can take quite a while, if the unit has been running for some time.

Logging Frequency

The Goose saves log data on a set interval, determined by the logging frequency. To change the frequency, edit the value in the Logging Frequency input field and click Save Changes.

The acceptable range is 15 to 250 seconds. A lower frequency saves data more often, but at a cost of fewer days of saved data. The text under the graph, gives the number days that can be logged at the current logging frequency. The data log is a circular buffer. Once it fills up, old data is over-written by the newer data.

Delete Logs

To clear the log data, check the Delete Log History checkbox and click on the Save Changes button. In a few seconds the graphs should clear and graphing will resume in a few minutes, depending on the logging frequency.

Display Tab

Friendly names

On the Display page is a list of the friendly names for each device attached to the unit. If the Goose has I/O sensors, the friendly names for these can be located in the section below the device friendly names.

To change a friendly name, edit the name in the input field and click Save Changes. The friendly name for a device is saved as long as the device remains in this list, even if the device is unplugged.

Figure 6 - Display Tab

Delete unplugged devices

The list of friendly names includes all devices that are attached to the unit as well as those that were. This way if a device is unplugged and reattached later, the settings for the device are restored. However, these unplugged sensors count toward the 16 external sensors limit. If you need to remove these to make room for other sensors, then check the "Remove all unplugged devices" checkbox and click Save Changes.

Temperature Unit

Use the Temperature drop-down box to change the unit of measurement for temperature. Then select Save Changes to finalize the change.

Alarms Tab

Alarm Settings

From the Alarms tab you can setup the unit to notify you if a sensor's value goes outside of an acceptable range. For each sensor there is a Low Trip, High trip and Alarm State. Use the low and high trips to set the acceptable range for the sensor. If the current value of the sensor goes below the Low Trip or higher than the High Trip, or if the device is unplugged the alarm is considered tripped.

When the value goes back into the acceptable range or the device is reattached, the alarm is cleared. To control how you will be notified of alarm

Figure 7 - Alarms Tab

trips and clears use the Alarm State drop-down. The choices are E-mail, SNMP trap, Buzzer(if the unit has one), or a combination of these.

One notification is sent when the alarm is tripped and another notification is sent when the alarm clears.

Set the alarm state to Disabled if you do not want to set an alarm for a sensor. Make sure to click Save Changes after adjusting the alarm settings.

Test Alarms

The Test Alarms section is used to send test alarm trip and clear notifications. The following instructions describe how to use this feature.

1. Select a sensor to test from the Sensors drop-down.
2. Choose the method of notification from the Alarm State drop-down.
3. Use the Trap Type drop-down to pick between trip or clear.
4. Click the Test button to send the notification.

Event Log

The Event log is a chronological list of events that have taken place on the unit. This is where errors and warnings are listed as well as alarm notifications. The Event Log is also useful for debugging email and SNMP issues.

The default logging level is Verbose. To change this use the drop-down box to select the logging level and then click Set Mode.

Control Tab

From this tab you are able to manipulate any control devices that might be attached to the system. For instance, a Power Egg 2 would have the status of receptacles and buttons to turn them on and off. An example of this is shown in figure 8.

Figure 8 - Control Tab

Configuration Tab

Figure 9 - Configuration Tab

Network

The main network settings for the unit can be set in this section. To assign the unit a static IP address, fill in the Static IP address field, Static Net Mask, and Static Gateway fields.

Make sure the DHCP check boxed is uncheck if using a static IP address. The next two drop-downs let you enable/disable Telnet and SNMP. The HTTP Services drop-down lets you choose if you want to allow HTTP, HTTPS, or both.

The last two input fields let you set the HTTP and HTTPS ports. The default port for HTTP is 80, and 443 for HTTPS.

Time

For the unit to know the date, it needs to be able to connect to an NTP server. The IP address for two servers can be entered.

If these fields are left blank the unit will use the default addresses of

E-Mail Configuration

SMTP Server IP Address: 216.131.192.5
'From' E-Mail Address: unit63G@iwatchdogs.com
"To" E-Mail Address(es): support@iwatchdogs.com

One address per line, no commas or semicolons

POP3 Server IP Address: 216.131.192.5
POP3 Username: jwedc@iwatchdogs.com
POP3 Password: ••••••

Save Changes

Figure 10 - Email Configuration

192.5.41.40 and 192.5.41.41. To adjust the time retrieved from the NTP server for time zone and/or Daylight Savings, use the "Time zone offset from GMT" field.

E-mail

The setup for E-mail is handled in this section. Enter the IP address of the E-mail server in the SMTP Server IP Address field. This needs to be in the numeric form. A named version (DNS address) will not work. You can ping the name of the email server to get this number.

The unit needs a From address to send email. The unit can send email to up to 5 addresses. Enter these in the To fields. Using commas or semicolons to concatenate email address is not supported, so make sure to only enter one address per line.

SNMP Configuration

SNMP Trap Community String: public
SNMP Trap IP Address(es): 192.168.123.101

Save Changes

Figure 11 - SNMP Configuration

Some email servers require a POP3 connection to be made before it will accept an email via SMTP. The last three fields are used for this purpose. You can leave these blank, if this is not required by your email server. Normally, the POP3 IP address will be the same as the SMTP Server IP address.

SNMP

This section is used to configure the unit for SNMP. Use the appropriate fields to set the community string for reads and traps. The unit is sent with "public" as the default address for traps and read fields. The unit can send SNMP traps to up to 4 addresses. Enter these in the SNMP Trap IP address fields.

User Accounts

Use the Name and Password section to control access to the unit. There are three levels of access. The highest is admin, which allows full access to the

Figure 12 - Accounts Configuration

unit. The second level of access is Control. This allows access to the Sensors, Logs and Control tab. Control access also lets the user change the logging frequency and delete the logs from the Logs tab. The lowest access level is

Figure 13 - Camera Configuration

Figure 14 - Device Configuration

Read-only. The user can view the Sensors and Logs tab. At the Read-only level, the user can not change the logging frequency nor delete log history on the Logs tab.

Camera

If a supported IP camera is configured in this section, the image from the camera is displayed in the Sensors tab page. Put the numeric IP address of an IP camera in the Camera IP address field. Select the camera model from the list of supported camera in the Camera Model drop-down.

Device

Information from the fields in this section is displayed in the footer of each webpage. Normally, this is information helps identify the Goose and the person responsible for its maintenance.

Update firmware

Below are the instructions to update the firmware on the unit. These instructions can also be found in the firmware zip file.

1. Download the latest firmware for your device from: www.itwatch-dogs.com/downloads.shtml

2. Connect the unit with a CROSS-OVER CABLE to the computer that will be used for the update. Trying to update a unit not directly

attached to a computer MAY damage the unit and will void your warranty.

3. Change your Network Interface Card's (NIC) settings to the following:

   IP address   '192.168.123.100'
   Subnet Mask   '255.255.255.0'
   Gateway   '192.168.123.1'

4. If you have enabled the built-in Windows firewall or any third-party firewall, disable it before continuing.

5. Extract the zip file to an easy to find location (ie a folder on your desktop or at the root level of your hard disk)

6. Open the folder in Windows Explorer.

7. Double-click on the 'updater.exe' file and follow the on-screen instructions.

8. If everything works properly, the device should be available for use about two minutes after the update is complete.

9. Restore the NIC's previous settings once the firmware update is complete.

If you run into any trouble while updating, please DO NOT reset your Goose. Contact ITWatchDogs at:

Phone : 512-257-1462

E-mail: support@itwatchdogs.com

Troubleshooting

Connecting to the Goose

I can not get the webpage for the unit.

Here is a list of steps for diagnosing and fixing the issue:

1. If DHCP is enabled, the IP address for the unit may have changed. Check with the DHCP server to find out the current IP address for the unit.

2. If the IP address of the unit was changed by DHCP or by the Configuration tab, make sure to use the new IP address to connect to the unit. Even if the IP address was changed, the unit can still be reached at 192.168.123.123.

3. Check the connections to the unit and the network. The power and link indicators should both be on and stable. The activity light should blink periodically. If the power light is not on, check the connection on both ends. If the link light is out then check the network cable connections. A cross-over cable should be used for connecting directly to a computer and a straight-through should be used for connecting to a network.

4. Ensure the network card settings are appropriate for the IP address of the unit. The recommended network settings for a unit at the default IP address are:

   IP Address: 192.168.123.100
   Subnet Mask: 255.255.255.0
   Gateway: 192.168.123.1

5. Try to contact the unit using ping, telnet or ftp. For instance at the default IP address these commands would look like the following:

ping	192.168.123.123
telnet	192.168.123.123
ftp	192.168.123.123

6. If the unit is not at the default IP then the correct IP address would need to be substituted for the
    192.168.123.123.

7. If the unit is still unreachable, it may be on a different subnet, could be blocked by a firewall, or a proxy could be preventing access. These are networking issues beyond the scope of this document.

I/O Ports

How do I attach an I/O sensor to the I/O port?

The I/O ports supports up to 3 I/O sensors. The I/O port block has 2 sets of openings, a top set and bottom set. The openings are labeled C, 1, 2, 3, and C.

The top openings are used to open the bottom so that a wire can be inserted. Each I/O sensor has two wires. The positive wire (normally red) should be inserted into a bottom opening, labeled 1, 2, or 3.

The negative wire (normally green or black) should be inserted into a C opening. Since three I/O sensors can be attached and there are only two C openings, more than one negative wire can be inserted into a C. Only one positive wire should run to a 1, 2, or 3 opening. The following instruction
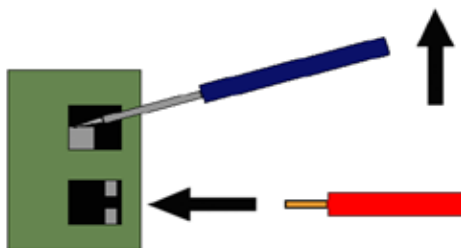

Figure 15 - Inserting wire into an I/O Port

describes how to insert a wire into the I/O block.

1. Make sure the lead is stripped.
2. Insert a small flat-head screwdriver into the top hole until it stops.
3. Gently, pry up with the screwdriver to open the spring-closed bottom hole.
4. Insert the wire into the bottom hole.
5. Release the tension on the top hole to allow the bottom hole to close, locking the wire in place.

Graphs

The graphs do not look right. They show dots, gaps, or appear blank.

Sometimes the log data can get corrupted. This will cause graphing issues. To fix this problem you will need to delete the log history. The following steps will explain how to do this.

1. Click on the Logs tab.
2. Download the logs by clicking on the appropriate link on this page. Skip this step if you do not need a backup of the log data.
3. Check the Delete Log History checkbox. If this box is grayed out, refer to the troubleshooting section on a grayed out logging frequency/delete logs checkbox.
4. Select Save Changes to delete the log history.
5. In a few seconds the graphs should go blank. Depending on the logging frequency, the graphing should begin in a few minutes.

Email

I have not been able to get email from the unit.

Below are some common solutions to email problems.

1. Check the Event Log for email errors. This may help diagnose the problem.
2. Make sure a numeric IP address is used for the SMTP Server IP address (and POP3 IP address if used).
3. The unit needs a From address to send an email.
4. There should only be one email address in each To field.
5. Some email servers require the POP3 fields to be filled in. If POP3 isn't required these fields should be left blank.
6. If an Exchange server is being used, then it needs to be configured to allow 3rd party emails. There is a checkbox for this purpose in the Exchange server configuration.

SNMP

What is SNMP?

SNMP is the Simple Network Management Protocol. It provides a way for network devices to communicate. In the protocol there is a manager device that uses SNMP to find out the status of devices on the network. These devices are called agents. Normally, the manager makes a request to an agent, and the agent responds to this request.

For example the manager asks the Goose for its temperature, the unit reads the temperature and sends this back to the manager. The exception to this is SNMP traps.

A trap is an alert sent by an agent to the manager about some abnormal condition. For instance, if the temperature on the unit leaves an acceptable range, the Goose can send an SNMP trap to the manager.

How do I get the MIB for the unit?

The MIB for the unit can be found in two places. In the header of the unit webpage, under Alternate Formats, is a link to the MIB. A copy of the MIB is also included in the firmware zip file of version 2.53 and higher.

I need the OID's for the unit.

In the zip file for firmware versions 2.53 or higher there is a CSV file that contains the list of OID's for the unit.

I have not been able to get a SNMP trap from the unit.

A SNMP manager must be configured to receive traps from the unit. Most SNMP programs have a database of traps they are monitoring for. T

he possible traps that can be sent by the unit must be added to this database. Some programs can take the unit MIB and extract the trap information. With other programs the trap data has to be entered manually.

A CSV file is included in the firmware zipfile of version 2.53 and higher. The CSV includes the OID's for the unit as well as the information for each trap. Below is a list of issues that might stop you from getting traps from the unit.

1. See if there are errors in the Event Log.

2. Not all SNMP software is able to receive traps. Check if the software can receive version 1 traps.

3. Make sure the IP address configured on the unit, matches the IP address of the SNMP manager.

4. Ensure that the Trap Community String on the unit, corresponds to the community string expected by the manager.

5. On some SNMP software, you have to enable trap monitoring and SNMP requests.

Buzzer

Is there a way to turn the buzzer off remotely?

The Test Alarms feature can be used to turn the buzzer off remotely. The following step will lead you through this process.

1. Go to the Alarms tab.

2. Scroll down to the Test Alarms section.

3. Pick one of the internal sensors from the Sensors drop-down.

4. From the Alarm State drop-down, choose Buzzer.

5. Select Clear from the Trap Type drop-down.

6. Click on the Test button.

The buzzer should turn off in a few seconds.

Temperature

The internal temperature on my unit seems to be reading high.

The internal temperature can read 2-3 °F higher than an external sensor, because of the heat generated by the circuits in the unit. The following steps can help minimize internal heating.

▪ Make sure there is good airflow to the unit.

▪ Heat can be transferred to the unit from other sources and through the rack. If possible mount the unit away from heat sources.

LCD Display

The LCD on my unit displays No Devices or does not show me the sensors that I want.

The checkboxes used for graphing on the Logs page also control which sensors will be displayed on the screen. Make sure the sensors you want to show on the LCD are checked on the Logs page.

Logging Frequency/Delete Logs Grayed Out

I want to change the logging frequency or delete the logs, but they are grayed out.

An account level of Control or Admin Access is required to change the logging frequency or delete the log data. It will grayed out if the current access level is not high enough. To change this, do the following:

1. To change to Control access click on the Control tab. For Admin click on Configuration.

2. Enter the appropriate username/password for the appropriate account.

3. Click on the Logs tab and the Logging Frequency and Delete Log History checkbox should not longer be grayed out.

Product Summary

I/O Port Sensors

Door Contacts – Allows the unit to detect whether the contacts are open/closed.

Water Sensor – Used for detecting liquid that could damage your gear.

City Power Monitor (CPM) – Tells the unit if power was lost to a electric plug.

Pollution Sensor – Gives you a measure of air quality.

Current Transformer (CT) – Allows you to measure AC amps.

Smoke Alarm – Be notified if the smoke alarm triggers.

External Sensors

Temperature – Provides remote temperature sensing.

Airflow/Temperature/Humidity – Combo sensor (humidity is optional) that provides monitoring for critical areas.

Power Egg I/II – Plug into an existing power strip and monitor power usage from the unit. The Power Egg II provides remote control (on/off) for two outlets.

CCAT – Special order item that converts an analog input into a 1-wire serial sensor.

Console

- Consolidate data from many units into a single web interface.
- Combine log data and push firmware updates out to several units at a time.
- Easily set alarm levels for a list of units.