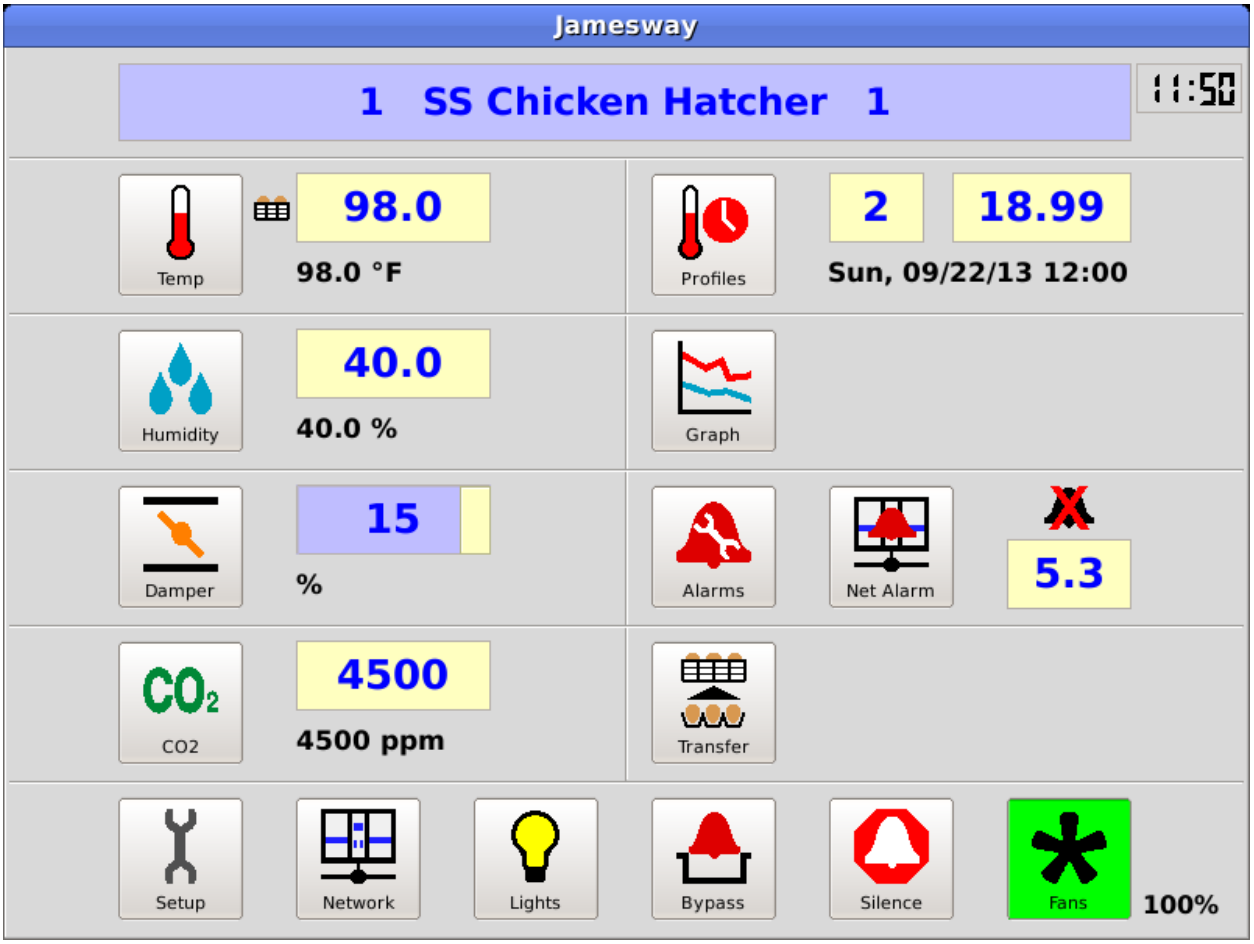
HatchSense User Guide

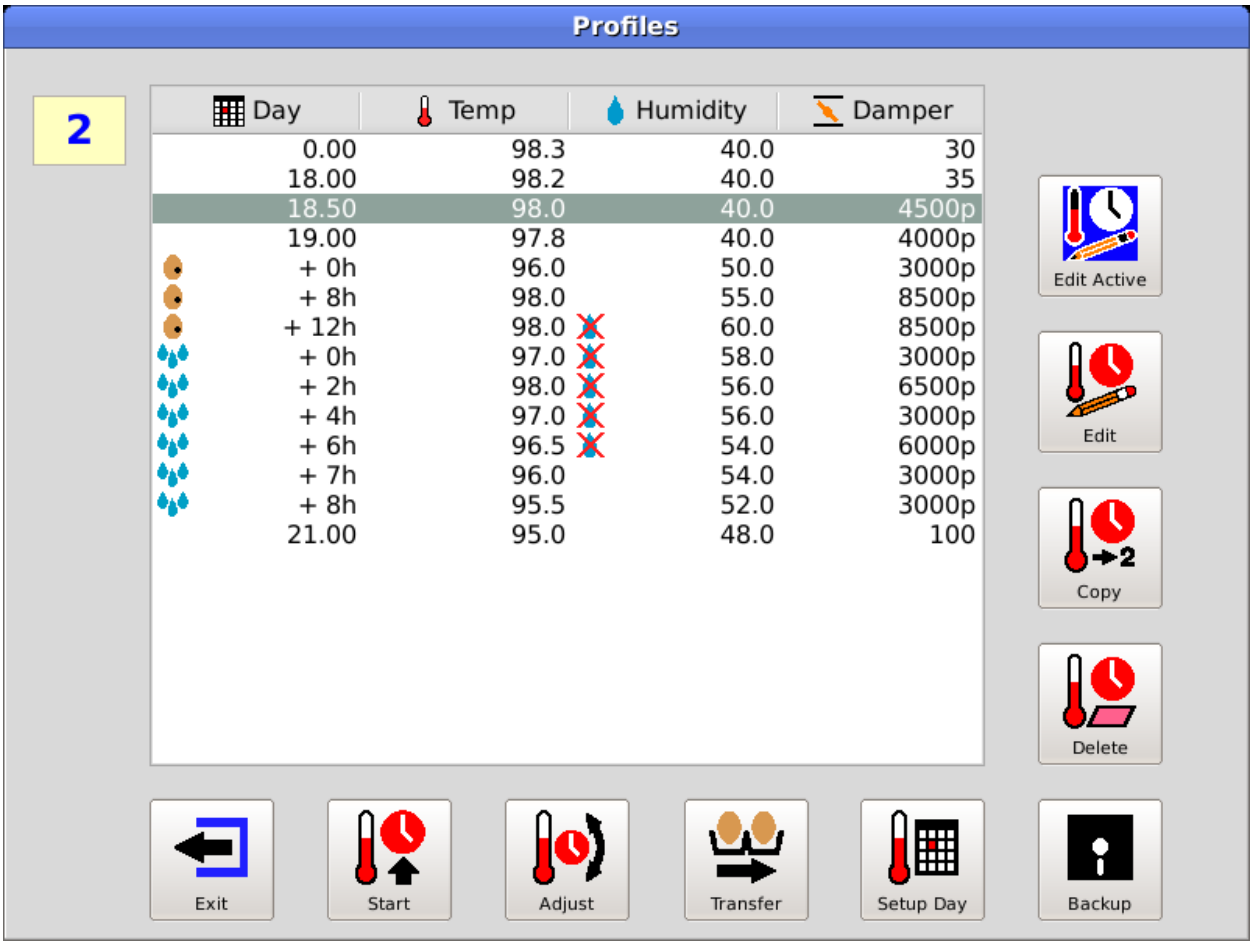
The HatchSense system allows the hatcher controls to watch for humidity changes and chick movement inside the baskets to initiate a sequence of modifications to the incubation environment to stimulate simultaneous hatching.

Main Screen

The following screen shot shows a hatcher with HatchSense mode active, as indicated by the basket icon between the temperature button and temperature actual readout.



The profile day in cycle counter will advance normally, but the profile contains a special block of setpoint steps that will be triggered when certain conditions are met. The following screen shot shows the active profile in profile setup screen.



Until day 19.16 (19 days and 4 hours) the hatcher profile runs normally, with the HatchSense module operating in test mode. When test mode is active any motion on one of the sensors blinks the corresponding LED light for a few seconds, allowing the user to check that the module is operating correctly at transfer time.

At day 19.16 the HatchSense module activates the white LED lights on rear side of module, continuously cycling on for 30 minutes, then off for 30 minutes. Throughout this time the motion detectors are active, scanning for motion inside the baskets.

Please note that the HatchSense module and baskets must not be disturbed during this time as that will mistakenly trigger the machine to advance to internal pip phase. If it is necessary to open the machine before profile has advanced to the internal pip phase, then the fan switch must be turned off so that the machine disables the motion detection system.

When motion inside at least two baskets is detected the profile will advance to first internal pip step in the profile marked as +0h, skipping all regular setpoint lines that have not yet executed. If profile day-in-cycle reaches the pip timeout programmed in HatchSense setup screen without seeing movement, it will immediately change to the first pip step. The next two pip steps will execute in sequence once the specified hours after initial chick movement is reached.

Once the third pip step is active, the machine will monitor for the humidity peak. The actual humidity has to go above setpoint by amount programmed in setup screen (first peak number) then stay at that level for some time, then go below peak humidity by amount programmed in setup screen (second peak number). The humidifier should be disabled in the last pip step to ensure that it does not interfere with the humidity peak detection.

When the humidity peak is detected, the profile will advance to the first humidity step marked as  +0h. The HatchSense module lights are turned off. If the profile day-in-cycle counter reaches the humidity timeout programmed in HatchSense setup screen without seeing the peak, it will immediately change to the first humidity step. All six humidity steps will execute in sequence as the specified hours after peak are reached. If the day-in-cycle counter reaches the first non-HatchSense step at the end of the profile, these will be executed immediately, even if not all humidity steps have finished.

There is one new alarm emitted by the hatcher, located to the left of the temperature button.

 The HatchSense alarm indicates that the module is not sending valid data. Some of the possible causes:

- sensor module cable is unplugged or damaged
- sensor module is faulty

This alarm can be programmed in Alarm Delays screen same as other alarms.

Profile Edit Screen

The profile edit screen has a toggle button to select whether a profile is a standard or HatchSense mode profile.

When turning on the HatchSense button, a special block of nine setpoint steps is inserted. Three of these steps are for internal pip phase, and the other six are for humidity peak phase. The number of steps is fixed, no steps can be added or deleted. If fewer steps are needed, then enter exactly the same numbers as the previous step.

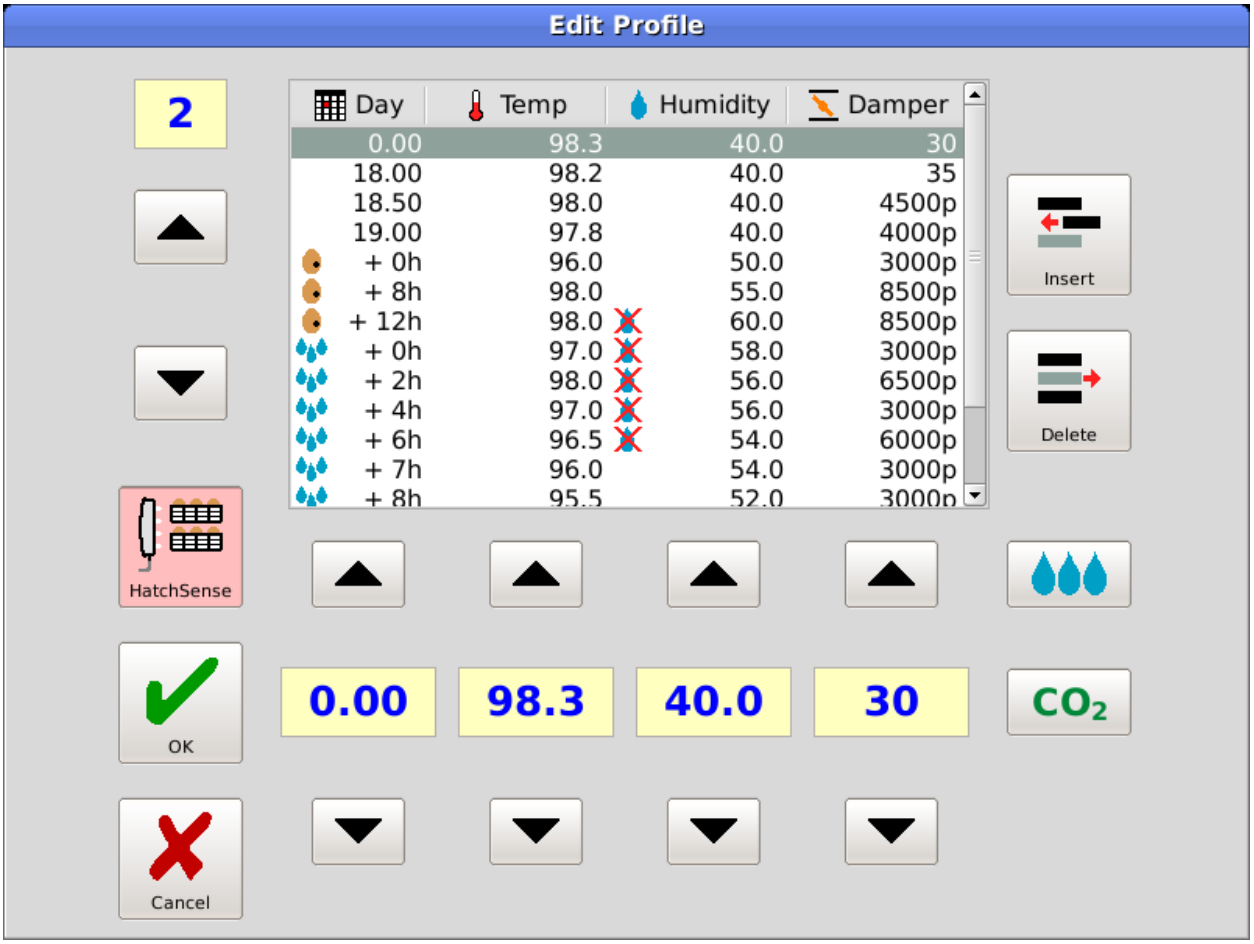
The HatchSense button is disabled if not enough slots are available in the profile. Delete some of the regular setpoint lines to make room for the HatchSense block.

Each setpoint step can be programmed to disable humidification. The third pip step should always have humidification disabled to prevent interference with the humidity peak detection. Other setpoint lines can be programmed as required.

As many additional regular non-HatchSense setpoint lines as required may be added. Steps whose day-in-cycle is less than the Internal Pip Timeout (as programmed in the HatchSense setup screen) will appear above the special HatchSense steps, all others will appear below the HatchSense steps.

For a HatchSense profile to be valid four conditions must be met:

- First profile step must be a regular setpoint at day 0.0
- First internal pip step must be + 0 hours
- First humidity peak step must be + 0 hours
- At least one regular setpoint step must appear below the HatchSense section (for example at day 21.0)



When the HatchSense button is in highlighted state, the profile will be saved as a HatchSense mode profile, otherwise it will be saved as a standard profile.

After pressing the OK button the user will be asked to select destination profiles. The machine will remember whether the saved profile is a standard or HatchSense mode profile. In the profile selection screens the HatchSense profiles will be marked with a basket icon.

Start Profile Screen

Hatchers using HatchSense profiles must be transferred before day 19.16, otherwise the motion detection phase may not be processed correctly. If a significant intervention is required inside the hatcher, then profile should be switched to a regular type.

The start profile screen uses a basket icon to indicate HatchSense profiles. The HatchSense profiles can only be selected if:

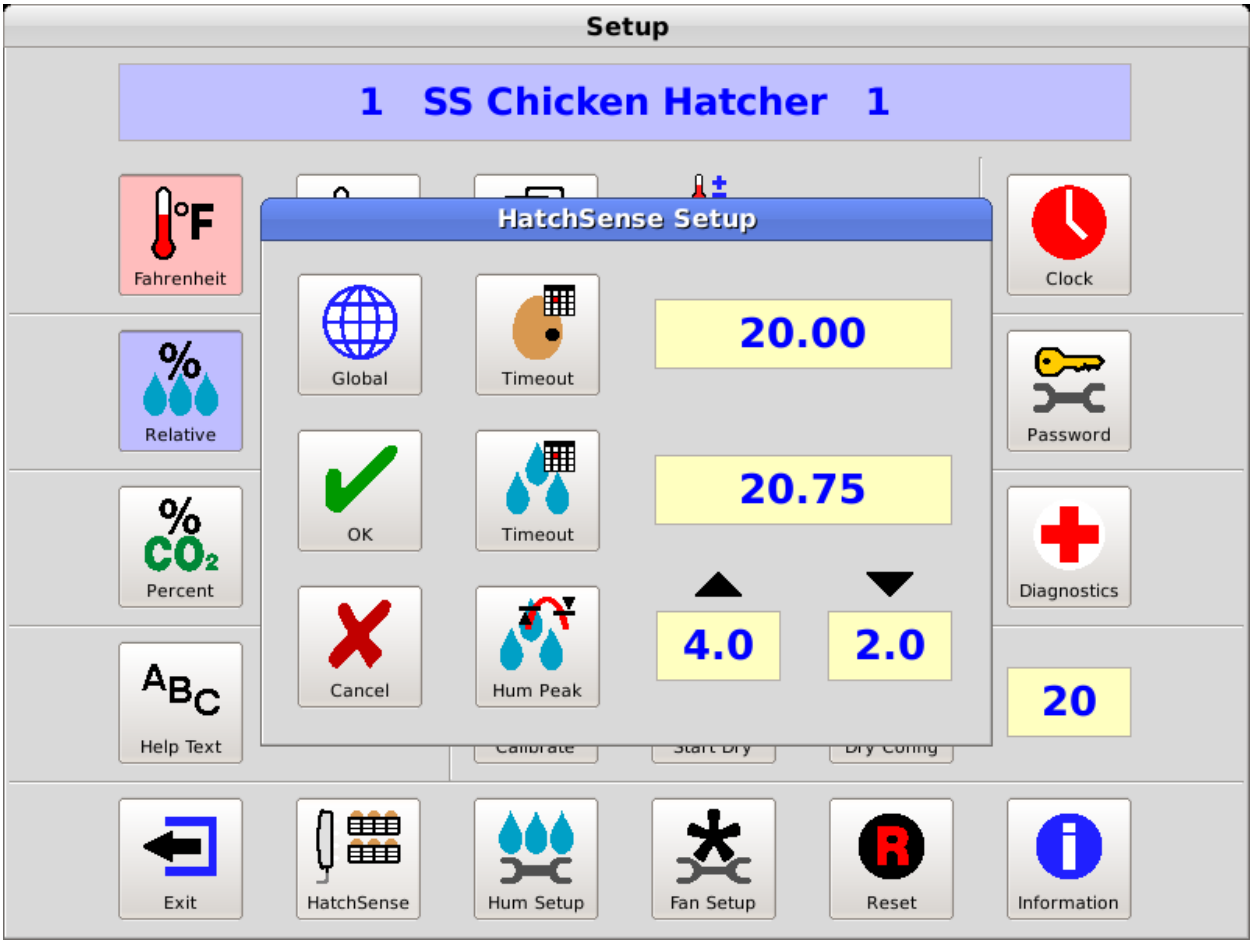
- A HatchSense module has been connected anytime since last power up
- A HatchSense profile is currently active

Copy Profile Screen

When copying a profile to another slot, the destination slot will become the same type as the source profile. Care must be taken if a HatchSense profile is copied globally to the network. A remote machine not equipped with the HatchSense system, but currently using the same profile will give a HatchSense failure alarm, which needs to be corrected by restarting a regular profile.

HatchSense Setup Screen

The HatchSense setup screen is used to program settings that are common to all HatchSense profiles.



Internal pip timeout sets the day-in-cycle when the profile advances to the pip phase even if chick motion has not yet been detected. This value should be selected such that the profile has sufficient time to complete the pip steps before the humidity level starts to peak, otherwise the humidity phase may not have enough time to finish. This number also selects the point where regular setpoint steps appear above or below the HatchSense block.

Humidity timeout sets the day-in-cycle when the profile advances to the peak phase even if no humidity peak has occurred. This value should be selected such that the humidity phase can finish before reaching the regular setpoints at end of profile.

The peak settings determine the humidity changes that need to take place before profile advances to humidity peak phase. The first number selects how far above setpoint (in %RH) the humidity needs to rise. Once the humidity stops rising, and the humidity stays below the maximum peak by the second value (in %RH) for two hours, then the profile will advance to the humidity peak phase.

Troubleshooting

The HatchSense system requires software version 3.27 or later on machines equipped with SMA106 revision C or earlier, and version 3.80 or later on SMA106 revision D or SMA111.

1. Turn off the fan switch and connect HatchSense module to communication outlet.
2. Check that green power light on HatchSense module is on. If the light is off then the module may be faulty or the communication outlet on console is damaged or incorrectly hooked up.
3. Check that yellow data light on HatchSense assembly blinks briefly once every second. This light will indicate if a signal is received from machine controller.
4. In the Setup screen choose the Diagnostics function. Verify that green check mark is shown beside "HatchSense". If no check mark is shown, then no signal is received back from HatchSense module, indicating that the module is faulty or cable connection is damaged.
5. Set HatchSense module on flat surface with the four black motion detectors facing away from moving objects. Wait for all four white LED lights beside detectors to turn off.
6. Move hand past each of the four motion detectors on rear side of assembly and check that the white LED light turns on for a few seconds. If a light does not turn on or stays on constantly then the module is faulty.

Note: The module is in test mode only when the fans are turned off or when day-in-cycle counter is less than 19.16, otherwise the white lights will not be controlled by the motion sensors.