



HOME AUTOMATION, INC.

**Model 32A30
Touchscreen Hub**

Installation Manual

**Document Number 32I30-1 Rev A
December, 2005**

INTRODUCTION

The HAI Touchscreen Hub is used to provide power, communications, and a video signal to HAI OmniTouch with Video touchscreens. Up to eight (8) OmniTouch touchscreens, with or without video, can be connected; however, you may connect an additional Touchscreen Hub for a total of up to 16 OmniTouch touchscreens when used with an HAI OmniPro II or HAI Lumina Pro controller. The Touchscreen Hub is required for connecting OmniTouch with Video touchscreens.

The HAI Touchscreen Hub provides battery backed power for HAI OmniTouch touchscreens, cameras (optional), and the HAI Video Encoder. It has convenient connections and power terminals for a neat installation. It also has six individual camera inputs, which can be selected by the HAI OmniTouch Touchscreen with Video for viewing. Six individual camera outputs allow the cameras to be connected to a second HAI Touchscreen Hub with Video Encoder, HAI Web-Link II for viewing on a monitor or handheld device, HAI Home Control for Windows Media Center for viewing and recording, and/or directly to television sets, video recorders, etc.

The HAI Touchscreen Hub was designed to eliminate unsightly transformers, power strips, external power supplies, battery backup units, and complex wiring normally associated with camera and touchscreen installations. In addition to simplifying the installation, the HAI Touchscreen Hub automatically sequences the startup of touchscreens and has a low voltage cut out feature for long term reliability and zero maintenance.

GENERAL

The HAI Touchscreen Hub is available in an HAI Omni Series Enclosure or on the HAI Universal Mounting Plate for installation in Structured Wiring enclosures. It is supplied with a sealed Power Pack, which provides power to the HAI Touchscreen Hub.

Features:

1. Connections for 8 touchscreens: Cat 5 (RJ-45) for HAI OmniTouch with Video (32A00-5) and 4-position terminals for HAI OmniTouch (32A00-1)
2. Inputs from 6 NTSC Composite color or b/w cameras
3. Pass-through outputs for 6 cameras to TV, modulator, media center, other displays, etc.
4. Power supply with battery back up for touchscreens and cameras
5. Connections for all Omni and Lumina controllers
6. Supports Video Encoder (mounts on Touchscreen Hub circuit board), required for video
7. Supervisory output can be connected to Omni zone to indicate low battery
8. Connectors for two sealed batteries, 12 V at 4 to 8 amp-hours each (not supplied)
9. Supplied with Universal Switching Power Pack

HAI Video Encoder

The HAI Video Encoder mounts onto the Touchscreen Hub. It digitizes video signals from the connected cameras and sends it to OmniTouch with Video touchscreens for viewing. It can be purchased bundled and factory installed on the Touchscreen Hub or added later in the field. The HAI Video Encoder is required to view video on OmniTouch with Video touchscreens.

INSTALLATION

The supplied Power Pack provides both touchscreen (24 VDC) and camera (12 VDC) power. An AC power outlet should be located within 5 feet. One or two sealed, rechargeable batteries (not included) can be used to backup the touchscreen and camera (optional) power. The two battery cables are in parallel, so by adding a second battery you will increase the battery backup time.

1. Connect one or two 12 VDC batteries using the supplied battery terminals. Connect the BLACK battery wire to the minus (-) terminal on the battery and connect the RED battery wire to the plus (+) terminal on the battery. DO NOT reverse the connections; the battery fuse will blow. Note that the unit will NOT START on the battery alone.
2. Plug the connector for the Power Pack into the mating connector of the HAI Touchscreen Hub marked "J33".
3. Plug the power cord from the Power Pack into a 120 VAC outlet. The "POWER ON" LED should illuminate.
4. Unplug the Power Pack. The Touchscreen Hub should continue to run off of the battery backup. The "POWER ON" LED should turn off.
5. Plug in the Power Pack. The system should start. The "POWER ON" LED should illuminate.

Each Touchscreen Hub MUST be grounded to the controller. The HAI controller and HAI Touchscreen Hub(s) must be grounded to the same earth ground to prevent any current from flowing through the RS-485 data bus (connections A and B). If not grounded properly, damage could occur to the HAI controller, HAI Touchscreen Hub, and/or OmniTouch touchscreens.

COMMUNICATIONS CONNECTIONS

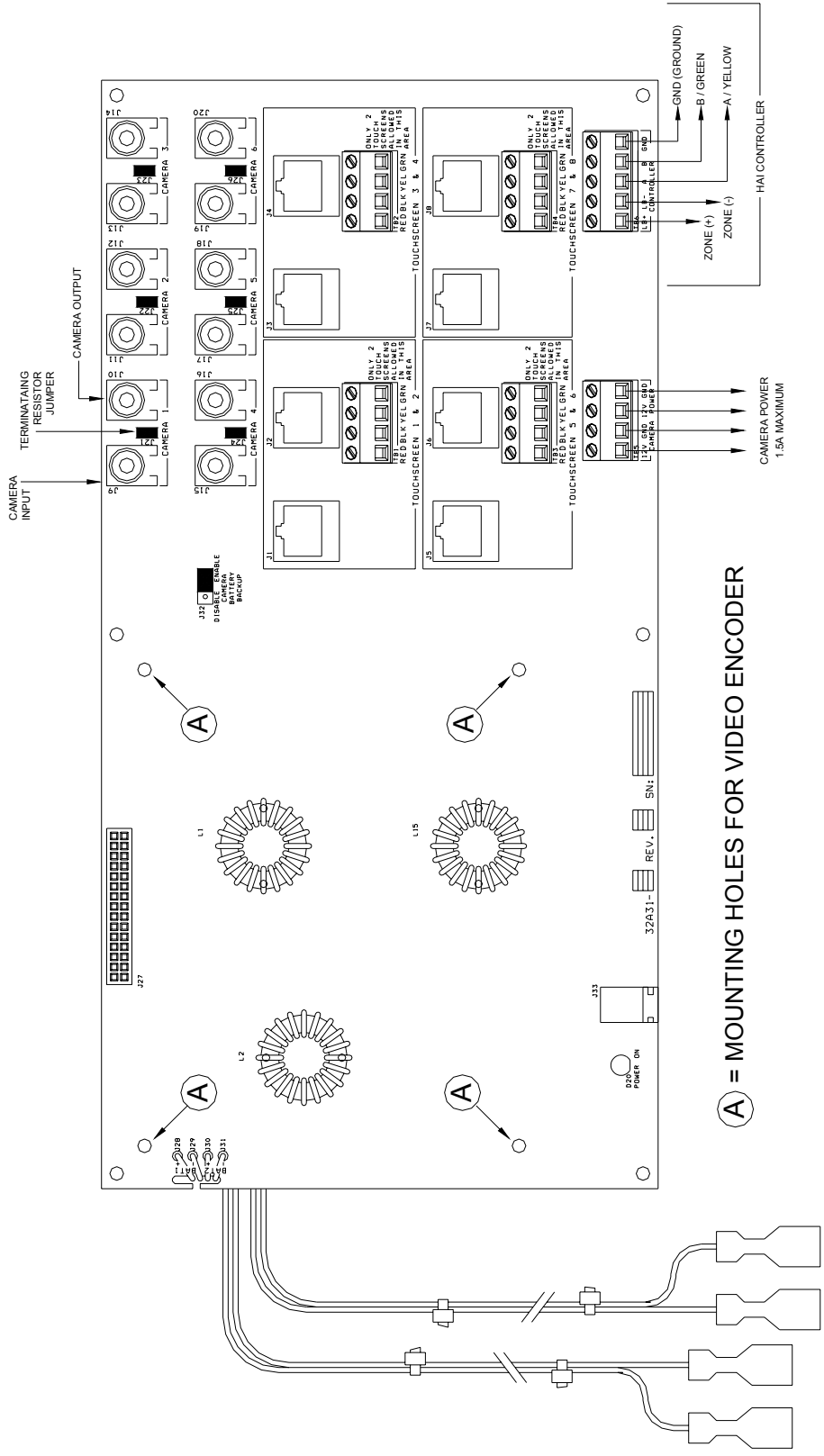
The HAI Touchscreen Hub provides a communications path between the HAI controller and the OmniTouch touchscreen(s) using the same wires that connect the consoles to the controller.

Connect the terminals labeled "A" and "B" on the HAI Touchscreen Hub under the section marked "CONTROLLER", to the corresponding terminals on the HAI controller.

Note: When connecting to an OmniLT, the terminal labeled "A" on the Touchscreen Hub connects to the "YEL" terminal and the terminal labeled "B" on the Touchscreen Hub connects to the "GRN" terminal under the section marked "CONSOLE" on the OmniLT controller.

The HAI Touchscreen Hub may be located in a remote location up to 800 feet from the HAI controller.

Remember to connect the "GND" terminal on the HAI Touchscreen Hub under the section marked "CONTROLLER", to one of the "GND" terminals on the HAI controller.



A = MOUNTING HOLES FOR VIDEO ENCODER

CAMERA INPUT

TERMINATING RESISTOR JUMPER

CAMERA OUTPUT

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

32A3111

Low Battery Indicator

When the backup batteries connected to the Touchscreen Hub become depleted, there are terminals on the Touchscreen Hub that are used to send a signal to the HAI controller to alert you of the low battery condition. To take advantage of this feature, you must have an extra pair of wire between the Touchscreen Hub and the HAI controller, and an available zone on the HAI controller.

Connect the terminals labeled “LB+” and “LB-” under the section marked “CONTROLLER” on the Touchscreen Hub to the “+” and “-” zone terminals of an available zone on the HAI controller. Do not use an end-of-line resistor on the zone. The touchscreen has a built-in 1K ohm resistor for this output. Configure the zone as a “Trouble” zone.

When the batteries on the Touchscreen Hub fall below a certain voltage threshold, the terminals “LB+” and “LB-” will open causing the zone on the HAI controller to trip, indicating a low battery condition on the Touchscreen Hub.

TOUCHSCREEN CONNECTIONS

Connections to touchscreens are divided into 4 different areas, labeled: “Touchscreens 1 & 2”, “Touchscreens 3 & 4”, “Touchscreens 5 & 6”, and “Touchscreens 7 & 8”. Each area can have a maximum of 2 touchscreens connected in it, either 2 OmniTouch with Video (32A00-5), 2 OmniTouch (32A00-1), or 1 OmniTouch with Video (32A00-5) and 1 OmniTouch (32A00-1).

Connections to OmniTouch with Video (32A00-5)

The touchscreen requires Cat-5 (4-pair) cable for operation. The Cat-5 cable provides power, communications, and the video signal from the HAI Touchscreen Hub to the touchscreen.

Run the Cat-5 cable between the touchscreen and the HAI Touchscreen Hub. The maximum distance between the Touchscreen Hub and each touchscreen is 800 feet.

Note: When calculating the distance between the Touchscreen Hub and a touchscreen, you must subtract the distance between the Touchscreen Hub and the HAI controller from the total distance. For example, if the Touchscreen Hub is 100 feet from the controller, the maximum distance between the Touchscreen hub and each touchscreen is 700 feet.

Terminate both ends of the Cat-5 cable with an 8-position modular connector (as if to make a standard network cable).

When connecting the OmniTouch Touchscreen with Video to the HAI Touchscreen Hub, insert the 8-position modular cable, coming from the touchscreen, into one of the RJ-45 connector (J1-J8) on the HAI Touchscreen Hub.

Note: Do not connect more than 2 touchscreens in a given area (see “Touchscreen Connections”).

Connecting to OmniTouch (32A00-1)

When connecting a standard OmniTouch to the Touchscreen Hub, it is very important to plan where the OmniTouch touchscreen will be installed and the gauge/type of wire you will use for the installation.

The touchscreen requires a minimum of 4 wires for operation (2 for power and 2 for communications). The required distance between the Touchscreen Hub and the touchscreen will determine the wire gauge/type you should use. To prevent the touchscreen from drawing more than the specified maximum current from the Touchscreen Hub, do not exceed the "Maximum Cable Length" based on the wire gauge/type according to the "Table 1".

Wire Gauge	Solid/ Stranded	Number of positive conductors	Number of ground conductors	Maximum Cable Length (feet)
24	solid	1	1	398
24	solid	2	2	800
24	solid	3	3	1000
22	solid	1	1	634
22	solid	2	2	1000
22	stranded	1	1	585
20	solid	1	1	1000
20	stranded	1	1	904
18	solid	1	1	1000
18	stranded	1	1	1000
16	solid	1	1	1000
16	stranded	1	1	1000

If cable with multiple conductors is used (such as Cat-5 cable), it is possible to connect multiple conductors together to achieve greater distance. For example, using only one of the 24 gauge conductor in the Cat-5 cable for power (1 for positive and 1 for ground), the maximum distance between the controller and the touchscreen is 398 feet. If you were to connect 2 of the 24 gauge conductors together (2 for positive and 2 for ground), the maximum distance between the controller and the touchscreen is then 800 feet. If you were to connect 3 of the 24 gauge conductors together (3 for positive and 3 for ground), the maximum distance between the controller and the touchscreen is then 1000 feet.

Note: The distance between the Touchscreen Hub and HAI controller combined with the distance between the Touchscreen Hub and a touchscreen, must never exceed a maximum distance of 1000 feet. When calculating the distance between the Touchscreen Hub and a touchscreen, you must subtract the distance between the Touchscreen Hub and the HAI controller from the "Maximum Cable Length" as listed in "Table 1".

Connect the "Red", "Black", "Yellow", and "Green" wires from the touchscreen to the "RED", "BLK", "YEL" and "GRN" terminals on the Touchscreen Hub, respectively.

Note: Do not connect more than 2 touchscreens in a given area (see "Touchscreen Connections").

CAMERA CONNECTIONS

The Touchscreen Hub takes the composite signal from any NTSC camera, digitizes it through the encoder, and then broadcasts it to the connected OmniTouch with Video touchscreens. The Touchscreen Hub supports 6 individual cameras. In the areas marked CAMERA 1 – CAMERA 6, there is a connector for the camera input (to connect the camera) and the camera output (to connect the video signal to additional source devices).

Camera Inputs

Connect NTSC composite cameras to the RCA connectors marked J9 (Camera 1), J11 (Camera 2), J13 (Camera 3), J15 (Camera 4), J17 (Camera 5), and J19 (Camera 6) on the Touchscreen Hub.

Each camera input has a terminating resistor installed at the factory for optional video performance. If the corresponding camera output is not being used, make sure that the respective terminating resistor jumper (J21 - J26) is installed (this is the default position from the factory).

Camera Outputs

Each of the 6 camera inputs also has a pass-through output. These outputs are used to connect a second HAI Touchscreen Hub, HAI Web-Link II for viewing on a monitor or handheld device, HAI Home Control for Windows Media Center for viewing and recording, and/or directly to television sets, video recorders, etc.

Using the on-board RCA connectors, connect camera outputs marked J10 (Camera 1), J12 (Camera 2), J14 (Camera 3), J16 (Camera 4), J18 (Camera 5), and J20 (Camera 6) to your additional source device(s) (e.g. video modulator, second HAI Touchscreen Hub, etc.).

When the video output is being used to connect a second source, remove the corresponding terminating resistor jumper J21 – J26.

Camera Power

The Touchscreen Hub has terminals to provide camera power to 12 VDC cameras. The camera power supply is also battery backed; however, this can be disabled so that the connected touchscreens run longer on the backup battery.

To power a 12 VDC camera from the Touchscreen Hub, connect the camera's power leads to the terminals labeled "12V" and "GND" under the section marked "Camera Power", observing proper polarity. The camera power supply can supply a maximum of 1.5 A to the connected cameras.

By default, the Touchscreen Hub is set to battery backup camera power when AC power is disconnected. To disable the battery backup of camera power, set the jumper marked "J32" to the "DISABLE" position (the leftmost and center pin). In this configuration, you will not be able to view cameras when AC power is disconnected.

CONNECTING A SECOND HAI TOUCHSCREEN HUB

When connecting more than 8 OmniTouch with Video touchscreens to an HAI OmniPro II or HAI Lumina Pro controller, a second Touchscreen Hub is required. To view video on the additional OmniTouch with Video touchscreens (the ones connected to the second Touchscreen Hub), a Video Encoder installed on the second Touchscreen Hub is required.

When connecting a second Touchscreen Hub, with the exception of cameras, make all other connections as described in this document.

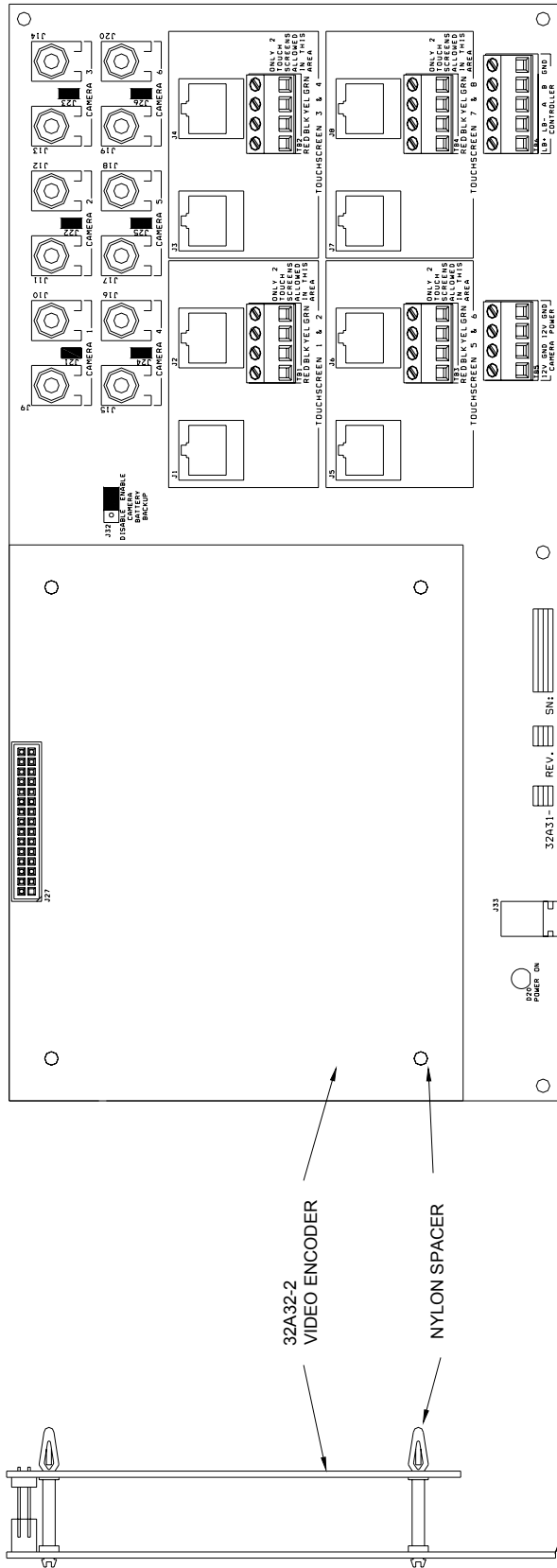
To view video on OmniTouch with Video touchscreens that are connected to the second Touchscreen Hub with Video Encoder, connect the camera outputs from the first Touchscreen Hub to the camera inputs on the second Touchscreen Hub. Make sure that you remove the corresponding terminating resistor jumper J21 – J26 from the first Touchscreen Hub.

INSTALLING THE 32A32-2 HAI VIDEO ENCODER

If you have purchased the HAI Video Encoder separately from the Touchscreen Hub, install the Video Encoder as follows:

1. Insert the short end of each of the 4 supplied nylon standoffs into the mounting holes on the Touchscreen Hub. Make sure that the standoff snaps into the mounting holes.
2. With the pins (marked “J2 ALT”) on the Video Encoder faced down, align the mounting holes on the Video Encoder with the installed standoffs on the Touchscreen Hub. Rest the Video Encoder board on the standoffs.
3. Align the pins (marked “J2 ALT”) on the Video Encoder with the connector (marked “J27”) in the Touchscreen Hub.
4. Gently push down so that the pins (marked “J2 ALT”) are firmly seated into the connector (marked “J27”).
5. Push down on the Video Encoder board at the locations of each mounting hole, so that each of the standoffs snaps into the mounting holes.

(Connections Diagram on Next Page)



32A32-2
VIDEO ENCODER

NYLON SPACER

32A30-1, -2, -3, -4
TOUCHSCREEN HUB

J37
DISCONNECTABLE
BATTERY
GROUP

CAMERA 1

CAMERA 2

CAMERA 3

CAMERA 4

CAMERA 1

CAMERA 2

CAMERA 3

CAMERA 4

TOUCHSCREEN 1 & 2

TOUCHSCREEN 3 & 4

TOUCHSCREEN 5 & 6

TOUCHSCREEN 7 & 8

UP CONTROL

DOWN CONTROL

LEFT CONTROL

RIGHT CONTROL

POWER OK

REV. 32A31-

SN:

J31

J32

J33

J34

J35

J36

J37

J38

J39

J40

J41

J42

J43

J44

J45

J46

J47

J48

J49

J50

J51

J52

J53

J54

J55

J56

J57

J58

J59

J60

J61

J62

J63

J64

J65

J66

J67

J68

J69

J70

J71

J72

J73

J74

J75

J76

J77

J78

J79

J80

J81

J82

J83

J84

J85

J86

J87

J88

J89

J90

J91

J92

J93

J94

J95

J96

J97

J98

J99

J100

SPECIFICATIONS

Operating Ranges:	32 - 120 degrees F (0 - 49 degrees C) 10 - 85 % relative humidity, non-condensing
Power Pack:	Output 19VDC, 3.79 Amps, Max 72W Input 120VAC, 1.8A amps, 60Hz
Maximum Power:	72 Watts
Batteries:	Sealed, Rechargeable, 12 volts, 4 - 8 amp-hours each
Low Voltage Cut Out:	10VDC
Main Fuse:	5A Polyfuse
Battery Fuses:	5A Polyfuse
	Polyfuses are permanent fuses that do not need replacement.
Camera Power:	Nominal Voltage 12VDC Maximum Current 1.5A