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T430 Very (VERY) Simple Projector Controller

(Ed Schoell rev: March 31st 2009)

The T430 is a budget-priced wired (RS232 and limited IR) remote controller for video projectors and flat panels, allowing just simple On-Off control, and an option of a basic toggle channel/source selection.

This is done with just two push-buttons, as the photo shows: just **Off/On** or **Off/On-Source**.

Ease of setup and installation has been an important design criterion, and this has been achieved by providing a data-base of pre-coded projector code families in all units, so all have identical software (which is field up-dateable). At install time, or whenever options (or projectors) are changed in a room, the changes are made by selecting device families with hex switches on the back of the unit.

Except for a major code upgrade for totally new devices, a laptop is never needed at install/setup time. There is ¼ Mbyte of memory in the unit for data-base storage.

Pre-made keyboards.

The keyboard is pre-made for either of the options, so there is no need to cut out bits of paper and slide them into switches, or print custom front key-legend sheets and fit them into windows.

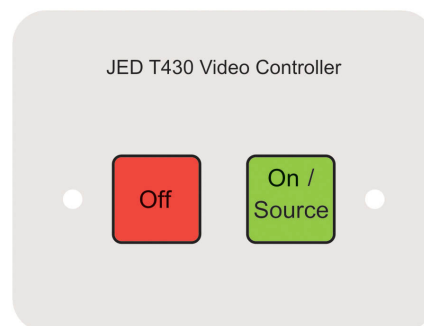
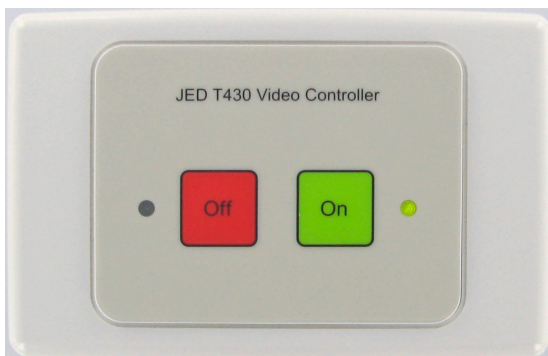
The key option (just Off/On or Off/On-Source toggle) is set on a DIP switch (Option 4).

The switches are tactile domes which give a good “feel” to the user.

LEDs indicate system states.

Two coloured LEDs are associated with the keys, and these are steady or flashed to signal to the user the current state of the system. (Note: No feedback from the projector is possible in the IR mode, no red LED flash status indication is possible, and because there is no absolute source selection with the initial IR device done, there is no initial channel selection possible during warm-up.) The system shows operation as follows:

- On power on (not IR), (or whenever a user presses the OFF button in the OFF state), the T430 polls the projector/flat panel for a status response indicating it, too is in the OFF state. A “Power Off” transmission is sent, to make sure the system is synchronised to the controller. At this point, the RED LED associated with the OFF key flashes once, if a proper “Off status OK” is received, and three times if it is not. (Some projectors don’t respond in the “Off” state so for these, the OFF LED just goes on.) The RED LED then stays ON to show the user the status of the whole system. This is a valuable test for users and installers, as it is so easy to test communications, with just one button press;
- When the user presses the ON key, a “Power On” command is sent, and the projector warms up for the pre-programmed time for that family. The GREEN ON LED flashes at a one-second rate during this time. During this time, the OFF key is locked out;



- As the T430 warm-up time finishes, the GREEN ON LED remains ON (still) and the channel which was last used is re-sent to the projector (not IR.);
- If the OPT4 option is selected on the DIP switch (i.e. with an “On/Source” keyboard installed), pressing the green key again will send the projector a command to switch to the alternate source (as selected on the DIP option switches) (These are: Computer1/Computer 2, Computer/Video and Video/S-Video, and other pairings or sources as setup by the constant setting sequence using the hex and DIP switches together);
- At the end of a lesson/show, the user presses the OFF button, (sending an OFF message) and the RED OFF LED then flashes once per second for the programmed cool-down period of that device. (With IR, the “Power” command is sent twice to simulate the request to push the “Power” key on an IR hand-held remote twice.); and
- At the end of the cool-down time, we are back at the start, with the OFF LED flashing once/twice/three times as a communications check occurs (not IR).

PIR input for automatic turnoff

A contact-close/open input allows an infra-red “people-detector” to sense whether all the class and presenter has left the building, leaving the video equipment running. The nominal time is one hour to closedown without a contact interruption, but this time can be programmed using the switches. (PIR stands for “Passive Infra-Red”).

Rear-view of the T430

Looking at the back of the T430 shows the connections and the setup switches.

Two options are available for the back connections:

- Phoenix connections; or
- CAT5 connector.

Phoenix connections:

Across the bottom, right-to-left, are two or three Phoenix plug-in screw terminals for wiring to the outside world. (shown without the plug-in part) They are:

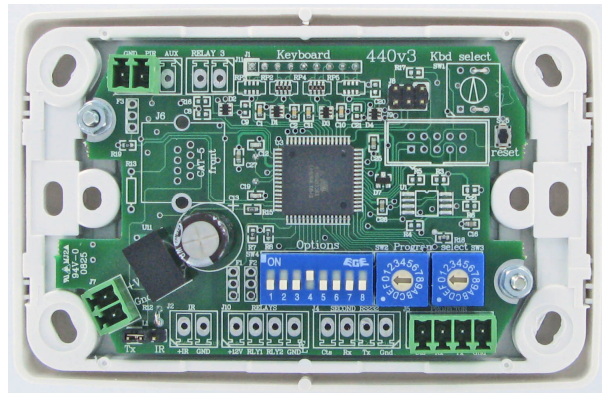
- Projector RS232 serial connection: same pin-out as the T460 and T440, with Ground, Tx (data out), Rx (projector reply) and CTS (optional, infrequently used);
- At the far left is the power input, in the range of 9 to 30 volts. Current is under 50mA but depends on voltage;
- Optional: IR transmitter output, (implemented for Epson X5/X5e only);
- At the top left is a two-terminal connection for the PIR input ;
- Optional: Just to the right of this is a two-pin connector with a drive to a device such as a USB switching device able select USB sources to an ELB (Electronic White-Board) from a room computer and a teacher’s laptop.

CAT5 connector:

To the left of the CPU chip, with this option, is a CAT5 socket. This is a quick wiring option for the communications/power/PIR to user connections on the other end of the CAT5 connector or the T447 “cable-top” box which provides terminations to the projector (DB9), power in socket, and PIR screw terminals. (It is NOT an Ethernet connection.)

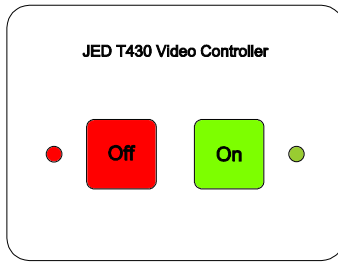
Switches:

- Two hex switches providing “Program Select” to select an entry in the data-base of projector/flat panels. It needs a screwdriver to select codes from 00 to FF. These switches are also used for constant entry (closedown time controlled via PIR, warm-up times, alternate channel selections etc;
- One 8-position “Option” switch, selecting options, eg alternate video and computer sources, auto-send of pixel align, triggered startup from PIR or Timer or switch, keyboard type, etc;
- One “Reset” push-button switch, used to enter “program re-load” or manually set options like time delays, etc.

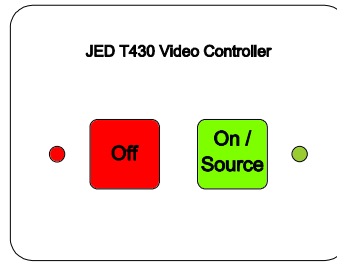


Keyboards

Following are keyboard options listed by ordering code:



Order code: T430-KB1-x



Order code: T430-KB3-x

For the “-x” at the end of the number:

- Use “-P” (default) for Phoenix green plug/socket connections for power, projector & PIR;
- Use “-Cat5” for no green connectors, but one CAT5 connector on the back for all wiring; and
- Use “-IR” for Phoenix connectors (inc. IR connection) and an IR “bug” for Epson X5, etc.

Projector families supported

The projector codes are selected by the two-digit hex switches on the back, and many projectors are supported by a particular driver. Minor variations are supported by allocating adjacent codes (eg supporting absolute or incremental audio volume setting or different reply or channel codes.)

The software data base of projectors supported on the T430 is the same as that of the T440, and will track it as new versions are released. New versions can be emailed to distributors and downloaded via the built-in downloader, via the one serial port (not the second one, as in the T440.)

As at Rev025 the supported families are:

Acer PD727, P1165, P1265, P5260, P5270, P5280,
P5370

BenQ MP5/7xx, SP820, Opt 771

Epson VP21, X5 via IR

HP projector

Hitachi proj

Infocus

LG LCD/Plasma TV

Mitsubishi

NEC LCD TV (& Sherwood), Plasma
and NEC Projector

Optoma (various)

Panasonic Projector

Plus U5, U7 Projector

Sanyo LCD TV, projector

Sharp

Sony projector

Toshiba projector

Taxan projector