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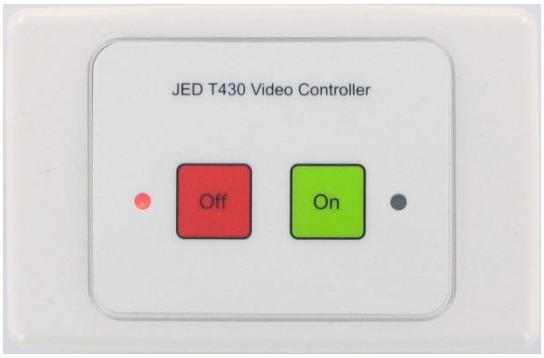
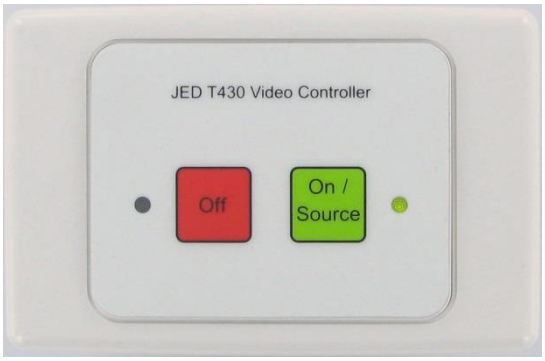
T430 Simple Projector Controller user's manual version V169 (part A)

(Ed Schoell rev: 13th. Mar 2025)





The T430 is a wired (RS232) remote controller for video projectors and flat panels, allowing simple On-Off control of the system, and optionally a simple toggle between two channels or sources.

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 the "**Program select**" hex switches on the back of the unit.

Two keyboard styles are provided, one with just an OFF and an ON key, and one with an OFF and an ON/Source key. This later allows toggling between two sources, from a mix of Computer and Video.

A DIP switch allows installers to quickly select several extra options, including which keyboard is installed and sources.

Connections: Power, one serial port, PIR (Passive Infra Red) sensor, optional IR projector drive or an optional CAT5 cable to the A/V world. An optional output can also drive a USB switch.

Several variables can be setup at install time, allowing for variable warm-up and cool-down times, timeout time for automatic PIR-controlled turnoff, and allocation of a wide range of computer or video channels to the source choices.

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. A boot loader is included in the CPU, located in upper memory, so no special programming dongles are needed; it just needs a PC with a serial port (or a USB to serial adaptor.)

Note: The T430 actually uses a T440 circuit board with custom parts loading and custom software … this is why the T430 drawings and PCB label shows T440, and why the T430 and T440 share part B user's manuals.

Operation of the T430

Red and green LEDs are next to the OFF and ON/Source keys respectively. These are steady or flashed to signal to the user the current state of the system. Pressing keys moves the operation through these various states.

Table of Contents

Operation of the T430 1	USB sw./Power ON relay interface 6	Reprogramming of the CPU 10/11
Rear view and T430 connections 2/3	PIR in for automatic turnoff 6	Wiring the T430 12
Setting up the T430 switches 3	OPT3: PIR in for timer Off 7	Trouble-shooting the T430 setup 12/13
Selection switch for options 3/4	Serial access to T440 setup info 7	Keyboard options 14
Selection of program/projector 4	Factory reset of constants 8	Wiring diagram 15
Setting of T430 constants/flags 4/6	Readout of version number 8	
	OPT7: Detection of proj. shutdown 8	
	Configuring the T430 8/9	

Off state (Blink codes)

In the OFF state, the red LED by this key glows continuously. A built-in test function is provided, which can be actuated by pressing the OFF key in this OFF state. This sends a test signal to the connected projector and blink codes show:

- If the red LED flashes ONCE, it indicates that communications was established correctly, and the reply was as expected;
- If the red LED flashes THREE times, it indicates a communications error, i.e. a disconnected or powered-off projector, a wiring fault, or a wrongly-set "Program select" switch on the back;
- If there is NO flash, it indicates that this particular projector normally has no response in the standby state, or an example projector has not had timing measurements done yet, so polls aren't tried;
- After none, one or three flashes, the red LED glows continuously.

Turn-on

Pressing the ON key starts the T430 warm-up cycle. This will send the "start-up" code to the projector.

The **green LED** by the ON button will flash once per second, for the pre-set warm-up time.

Warm-up

The warm-up time is preset and varies from projector family to family. The time can be altered at setup time to suit individual models in a manufacturer's range over a range of 1 to 159 seconds. See the following section: "Constant setting" for instructions on how to do this.

Run mode

At the end of the warmup time, the green LED will then flash for a short "lockout" period, and the chosen "channel select" command is sent to the device. It will start on the last (previously) used source/channel.

If a On/Source keyboard option is used, pressing the On/Source key again will toggle to an alternate source. The DIP switch selects the channel/sources which are toggled between. On source change the green LED flashes during a lockout time while the projector/panel changes channels. (If an "On" only keyboard is used, pressing the ON key again with send an "Auto-Pixel-Align" command (for a Computer channel) if it is available and needed by that projector. (Setting OPT2 switch ON will automatically send an "Auto-Pixel-Align" 30 seconds after any channel change to a "Computer" channel, in either keyboard configuration. (This time can be adjusted by altering Constant:7.)

Closedown

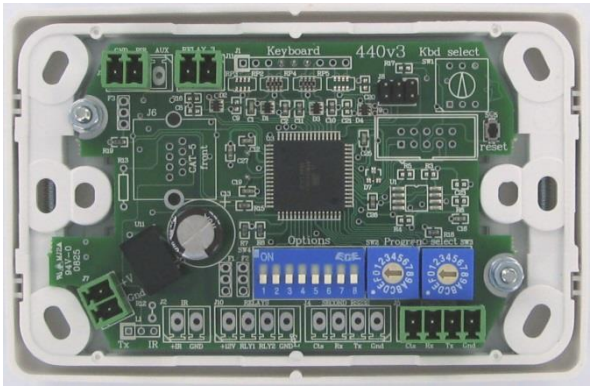
When the OFF key is pressed, the following actions happen:

- The projector is sent the "Powerdown" message;
- The OFF red LED starts flashing once per second.

At the end of the Cooldown period, the system returns to the OFF state above. (The actual Cooldown period can be programmed by a constant setup (see later).

Rear-view of the T430

Looking at the back of the T430 shows the connections and the setup switches. These can vary depending on the configuration ordered: If (green) Phoenix connectors used, (as in the photo to the right), they are as follows:



T430 Connections: Phoenix option

- At the bottom-right is a Phoenix connector for projector RS232 serial connection: same pinout as the T440/T460, 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 25 volts. Current is under 50mA but depends on voltage;

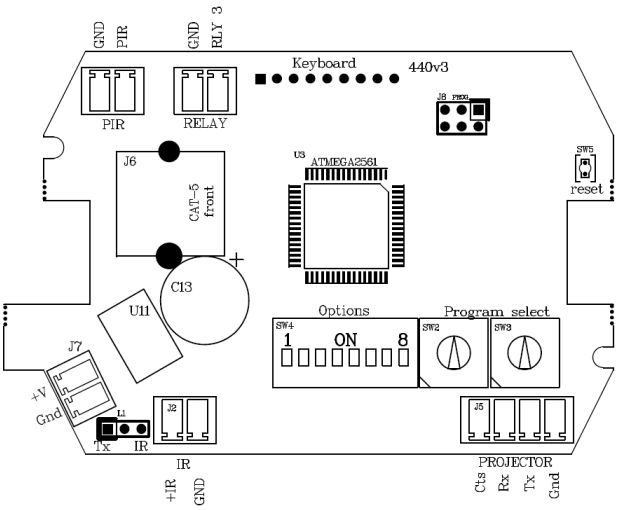
- Optional: 2-pin IR transmitter output (IR option only), just to the right of the power connector;
- At the top left is two-terminal connection J3, the PIR sensor input.
- Optional: Relay 3, a “USB switcher drive” or a “Power On relay drive.”

T430 connection: CAT5 option

Just left of centre in the photo to the right is a CAT5 socket. This is a quick wiring option for the communications, power, and PIR to user wiring 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, and wire colours are later in this manual section.)

T430 Switches:

- Two rotary switches provide “Program Select” to select an entry in the data-base of projector/flat panels. Use a screwdriver to select codes from 00 to FF;
- One 8-position “Option” switch, allows installers to select options, eg alternate video or computer sources, auto-send of pixel align and keyboard type;
- One “Reset” switch, used to enter “program re-load” or manually set “constants” such as time delays, etc. This is a small push-button switch.



Setting up the T430 switches

Selection of Options

An 8-switch options selection switch (SW4) is used to select install-time options.

NOTE: The OFF (default) position is with all sliders DOWN (by the switch numbers and green connectors).
Moving a switch to the ON position selects the option, as defined in this table:

Switch	On Function	Switch	On Function
OPT1	On: Swap Video 1 (usually Composite) and Video 2 (usually HDMI) sources, i.e. select which is used as main video source.	OPT5	On: Swap Computer 1 and Computer 2 sources, i.e. select which is used as main computer source.
OPT2	Set automatic sending of Auto Pixel Align after any Computer key selection. (Time after Computer command is Constant:7)	OPT6	Off: Select Video alone or Computer alone for dual source (as selected on OPT8). On: Select mixed video/computer in dual mode. (OPT4 on, OPT8 Off)
OPT3	(Not used.)	OPT7	On: Enable projector state sensing, and turn T430 off if OFF or COOLDOWN sensed
OPT4	Off: Limits T430 to control of a single source. On: Enables toggle mode between two sources, as determined by OPT1, OPT5, OPT6 & OPT8	OPT8	Off: Select Computer or Computer1/2 On: Select Video or Video 1/2

Note: In the following tables, OPT2 (Auto Pixel Align) and OPT7 (reply mode) are NOT included in the settings:

Source (single)	Option settings	Source (single)	Option settings
Computer 1	All OPTs Off	Video 1 (Comp)	All OPTs Off except OPT8: On
Computer 2	All OPTs Off except OPT5: On	Video 2 (Usually HDMI, alt S-Video*)	All OPTs Off except OPT1: On, and OPT8: On

The following table is for **KB3 keyboards ("Off" and "On/Source")**

Note: In the following tables, OPT2 (Auto Pixel Align) and OPT7 (reply mode) are NOT included in the settings:

Sources (dual)	Option settings	Sources (dual)	Option settings
Computer 1 & Computer 2	All OPTs Off except OPT4:On	Video 1 (Comp) & Video 2 (S-Vid)	All OPTs Off except OPT4: On, and OPT8: On
OPT6 ON for all following with split Computer / Video (Computer channel is default)		**OPT6 ON for all following with split Computer / Video (Computer channel is default)**	
Computer 1 & Video 1	All OPTs Off except OPT4:On and OPT6: On	Computer 1 & Video 2	All OPTs Off except OPT1: On, OPT4: On and OPT6: On
Computer 2 & Video 1	All OPTs Off except OPT4:On OPT5: On and OPT6: On	Computer 2 & Video 2	All OPTs Off except OPT1: On, OPT4:On,OPT5:On, OPT6:On
OPT6 ON and OPT8 ON for all following with split Computer / Video 1 (Video channel is default)		**OPT6 ON and OPT8 ON for all following with split Computer / Video 2 (Video channel is default)**	
Video 1 & Computer 1	All OPTs Off except OPT4:On OPT6: On, OPT8:On	Video 2 & Computer 1	All OPTs Off except OPT1:On, OPT4: On OPT6: On, OPT8:On
Video 1 & Computer 2	All OPTs Off except OPT4:On OPT5:On,OPT6: On,OPT8:On	Video 2 & Computer 2	All OPTs Off except OPT1:On, OPT4: On OPT5: On,OPT6: On, OPT8:On

Note: When changing selection, you will have to press the RESET button to cause the system to read the switches, and cycle the system between the choices (with the ON button) to make sure they are setup, and then press the OFF button to save the selections.

Selection of the program/projector

SW2 and SW3, the "Program select" switches shown in the T430 rear view, are normally used to select a family and/or make of projector. These switches are read on Reset (pressing the RESET button) or power on, and determine what codes are sent to the projector as front panel keys are pressed.

(In this documentation, when a code "2A" for example, is quoted, it means the first hex digit, "2" is set onto the left-hand switch, SW2, and the second hex digit, "A" is set onto the right-hand switch, SW3.)

Codes from 00 to DF are used for projector program selection: use the projector tables in the "Projector data" section of this manual to choose a program code and set it into these two switches.

(Codes from E0 to FD are used for setting preset constants (such as warm-up time), code FE is used for a "Restore factory presets", and FF is used as a test and diagnostic mode.)

Setting of constants in the T430

The T430 has built-in non-volatile memory (i.e. it maintains its contents even if power goes down).

This memory is used to save the series of constants (typically set or adjusted at T430 install time), for example:

- Altered Cooldown and Warmup and AutoPixelAlign delay times;
- Select a particular non-default channel (e.g. a Component or HDMI channel in place of the default Composite Video);
- Set the timeout for the internal timer used to turn off the projector if everyone leaves the room; or

- Set mode of Relay 3, to USB (default) or Power switch.

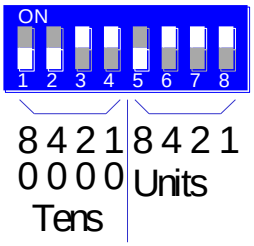
The constant setting process

To set a non-volatile constant, several steps are done in sequence:

1. Setup the DIP switch called “Options” to a value to be loaded into that constant;
2. Setup the “Program select” hex switches to address the constant. The constants are addressed by setting the switches to a number in the range E0 to FD, allowing for 30 constants. The meaning of a particular constant and its hex (switch) address is listed in the following tables; and
3. Press the RESET switch.

   If this is done properly; the green LED will glow for 2 seconds and then turn off. The 2-second blink indicates that the constant was setup and saved correctly. (Note: Initial release V025 omitted the green flash. Oops!)

Setting a value into the Options switch

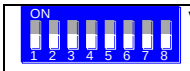


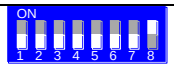
A decimal value in the range 0 to 159 can be set on the “Options Switch”. The switch is divided into two groups of four switches.

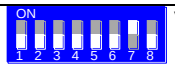
ON is the position with the slider moved UP, and is shown in WHITE in these drawings.

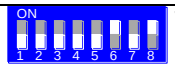
The first (right) four (switches 5, 6, 7 and 8) are coded into the “units” part of the number as a BCD setting from 0 to 9.

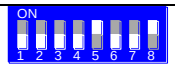
The second (left) four (switches 1, 2, 3, and 4) are coded into the “tens” part of the number, extended to set a value from 00x to 15x. **NOTE: This means value:11 is set by OPT4 and OPT8 both ON, (NOT hex 0B, OPT5,7 & 8).**

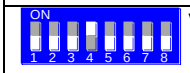


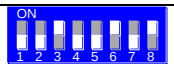


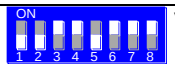


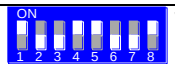


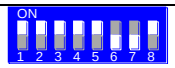












Program select switch setup for constant setting

Constant	Program select switch setting		Usage	Range for units	Comments
	SW2	SW3			
Constant:00	E	0	“Computer 1” key message	1->7	Main, or “Computer 1” key
Constant:01	E	1	“Computer 2” key message	1->7	Second, or “Computer 2” key
Constant:02	E	2	“Video 1” key message	1->15	Main, or “Video 1” key
Constant:03	E	3	“Video 2” key message	1->15	Second, or “Video 2” key
Constant:04	E	4	Spare		
Constant:05	E	5	Warmup time	1->159 seconds	
Constant:06	E	6	Cooldown time	1->159 seconds	
Constant:07	E	7	AutoPixelAlign time delay	1->159 seconds	(after Computer message), **Defaults to 30 sec. if value is 0**
Constant:08	E	8	Closedown timer	0->15 hrs, 54 mins in 6 min steps	“01” = 6mins, “45” is 4 h, 30 m. **Factory Default of “00” sets 30 mins automatically. Rev 017**

Constant	Program select switch setting		Usage	Range for units	Comments
	SW2	SW3			
Constant:09	E	9	Remote LED mirror	If set to 50, mirrors On/Off LEDs to relay 1 & 2 (needs FETs installed).	
Constant:0A	E	A	Unused in T430		
Constant:0B	E	B	Unused in T430		
Constant:0C	E	C	Enable/start/stop mode setting for PIR input. See Page 6 for detail.	(OPT3 switch OFF is normal, ON enables these functions.) 5= PIR starts, closedown timer stops; 6= PIR starts, PIR extends On time, closedown timer stops.	
Constant:0D	E	D	Control of Relay3	0= Relay3 tracks Computer2, 1= Relay3 On/Off on Power up/down (e.g. to operate external audio amp power On/Off)	
Constant: 0D -> 1B			Unused		
Constant:1C	F	C	Interbyte Tx delay	Over-ride time between bytes transmitted. Setting of 00 uses presets. Setting 1->100 (01->A0) sets 10's of microseconds (i.e. 10->1000uSec. Setting 101->159 (A1->F9) sets 1 to 59 milliseconds interbyte Tx delay.	

Flag settings.

WHEN A UNIT IS RE-LOADED WITH A NEW HEX FILE, THE T440 FLAG "F" IS RESET TO "0".

Two flag options are provided in the T430.

One selects whether the codes sent are for "projector" or "panel". Bit 0 of Flag DF sets "projector" if flag DF bit 0 equals "0", and "Panel if bit 0 equals "1".

- To set the T430 for **projector** control, set DF on the rotary switches SW2 and SW3 (addressing flag "F"), and switch off all the option switches. A green LED blinks for 2 seconds;
- To set the T430 for **flat panel** control, set DF on the rotary switches SW2 and SW3 (addressing flag "F"), and switch off all the option switches except OPT8 switch, which is to be On. A green LED blinks for 2 seconds.

Then push the small RESET switch on the back.

The device is now ready to be set to a code and option setting. Don't forget to press the RESET switch again.

The second flag selects whether source commands or sent, or just On and Off codes. If Bit 1 = 0, source codes are sent (the default option). If Bit 1 = 1, source transmission is supressed.

- To set the T430 for normal source transmission, set DF on the rotary switches SW2 and SW3 (addressing flag "F"), and switch off all the option switches. A green LED blinks for 2 seconds;
- To set the T430 for **supressed source transmission**, set DF on the rotary switches SW2 and SW3 (addressing flag "F"), and switch off all the option switches except OPT7 switch, which is to be On. A green LED blinks for 2 seconds.

Then push the small RESET switch on the back.

The device is now ready to be set to a code and option setting. Don't forget to press the RESET switch again.

UserFlag:E	D	E	If #7 =0, no prestart msg. If #7 =2, send prestart msg, e.g. HDBaseT ctrl. En.	#7
UserFlag:F	D	F	If #8 = 0, system controls projectors. If #8 = 1, system controls flat panels. If #7 = 0, Ops Tx normally, if #7 = 2, system does NOT Tx source & Volume	#8 #7

Hardware interfaces of the T430

Relay3 (USB/VGA switch drive or power control relay drive)

Connector J11 is for Relay 3, an N-channel FET output. This is used for control of ancillary equipment.

There are two functions allocated to this relay:

Default (Constant:D=0): Relay3 tracks "Computer2" selection. This is typically to drive a USB switch controlling which computer drives the USB port of an Electronic White-Board (ELB), (and possibly a VGA and audio switch.) JED has a USB switching device in design, the 439. Call for details.

Selected (Constant:D=1): When the ON key is pressed, Relay3, is actuated … this can be used to turn on external audio equipment (powered speakers, etc) via an isolation relay, such as Boolean Engineering's "Easyswitch".

The drive to Relay3 is turned OFF when the OFF key is pressed.

The two screw terminals on the Easyswitch connect to the RL3 and Gnd on, J11.
See: http://www.booleanengineering.com/expeasy/

It is also possible to drive a normal magnetic or opto-isolated zero-crossing 240vAC relay from this output, by connecting the positive end of the relay to the +12 volts connection on power input, connector J7.

IR LED driver

(Optional) connector J2 is for an IR LED transmitter. See Epson X5 (part B) for details of implementation.

Closedown Timer and PIR input for automatic turnoff

Connector J3 is used as two contact-close/open inputs.

A PIR infra-red "people-detector" senses e.g. whether all the class and presenter has left the building, leaving the video equipment running.

The time-out is set as Constant:8. **If left at the default of 0, the default time of 30 mins (setting of 05) is assumed. This default was first introduced in rev 017. No timeout is actioned UNLESS J3 "PIR In" is grounded either via a piece of wire or a PIR "normally-closed" relay contact.**

The number placed into Constant:8 is a time-out count of 6-minute intervals, and a Constant:8 value of 10, for example, is one hour. The maximum count is 159, i.e. 15 hours and 54 minutes. (9 x 6 mins= 54 mins)

This timeout is reset by any key operation, i.e. the On or On/source key.

The timeout only operates when the input on the PIR pin is shorted to ground by the NORMALLY-CLOSED relay output of the PIR detector. When the PIR senses a person in its sensor beam, the relay opens, and the PIR input pin is pulled up by a resistor on the T430. This clears the counter in the same way a key-press does, and the counter restarts.

Note: This function can be used without the PIR, just as an OFF-timer. When the timer is about the close the system down, the green LED and the OFF LED flash alternately for 30 seconds before closedown. Pressing the On or On/Source key will cancel the timer and restore operation for a further timer preset period. If using without a PIR, the PIR screw terminal must be shorted to the Gnd screw terminal via a short piece of wire.

(PIR stands for "Passive Infra-Red".)

OPT3: PIR input for remote enable/start/stop mode setting for PIR in

There is a number stored in Constant:C which is used to determine the mode for external control inputs into Connector J3's Aux input is for auxiliary inputs, eg a card swipe reader, key switch, a programmable timer or a simple "Push-to-start" customer push button for system enabling or starting. Constant:C also controls use of the PIR input to Connector J3 to automatically start projector operation (and optionally continue it, if there are repeated PIR pulses).

NOTE: These functions are only enabled when OPT3 switch is turned ON.
If this switch is turned OFF, the T430 ON key can be used, allowing easy setup of default channels and other testing. Then turn OPT3 switch ON to engage these control functions (and disable the ON key(s)). After a PIR initiated turn-on, the starting channel is the saved, (last used) one before turnoff.

The value set into Constant:C determines these remote enabling and control functions (only with **OPT3 = ON**):

- **Constant:C = 05: PIR start, Timer stop mode:** This mode uses a contact OPENING on the J3:PIR in exactly the same way as pressing the "ON" keyboard key, and the projector starts. The PIR contact is not tested again, and the projector turns OFF when either the OFF button is pressed or the internal Closedown timer (set at Constant:8) times

out. (The ON key can also allow a manual start.)

The effect of this is that after a person is detected, the projector runs for a fixed time (i.e. Closedown time) and the timer is not reset by PIR detections;

- **Constant:C = 06: PIR start, PIR extend, Timer stop mode:** This mode uses a contact OPENING on the J3:PIR in exactly the same way as pressing the "ON" keyboard key, and the projector starts. The PIR contact IS tested again, and the projector turns OFF when either the OFF button is pressed or the internal Closedown timer (set at Constant:8) times out. The PIR input is tested, and it resets the timeout on a contact opening. (The ON key can also allow a manual start.)

  The effect of this is that the PIR can turn on a projector and keep it on continuously (i.e. time is extended) while people are being detected. The Closedown timer closes it down when no more interrupts are detected.

Software aspects of the T430

Serial port access to T430 setting information

If a T430 installer wishes to check the program version, examine switch settings and meanings, Constant settings, keyboard settings etc, a test/debug mode can be entered. To do this:

- Connect a T430/T440/460 "reprogramming" cable from the serial port, (i.e. a Phoenix to DB9 cable) to a PC serial port (or USB to RS232 cable);
- Load and run a terminal emulation program such as "Bray Terminal" (JED's favourite) or Hyperterminal;
- Set a baud rate of 38400 8N1 and connect on-line;
- Set the "Program select" switch to FF hex; and
- Push the RESET button.

The terminal display looks like:

```
Hello World from JED T430V141F  ← Note version number
This build at: 1049 on: 15/08/2018
Hardware design and software (c) JED Microprocessors 2008 to 2013
To exit, select a non-FF switch setting and reset using reset switch

Non-volatile flags: D0 = 00000000b
Non-volatile flags: D1 = 00000000b
Non-volatile flags: D2 = 00000000b
etc to
Non-volatile flags: DE = 00000000b
Non-volatile flags: DF = 00000001b

etc
Non-volatile constant: E0 = 00h
Non-volatile constant: E1 = 00h
Non-volatile constant: E2 = 00h
etc to
Non-volatile constant: FC = 00h
Non-volatile constant: FD = 00h
Option switches: 00h, 0
Program select: FFh     Test mode
Keyboard type:  06h     KB2:Source/On, KB3:Off
Option switches: 00h, 0
```

Rotating the program select switches will show the loaded projector selections by the Program Switch hex settings.

Factory Reset of constants

If a system needs to have all constants reset to 00 (i.e. the default settings):

- Set the "Program select" switch to FE hex;
- Turn on all Option-switches; and

- Press the Reset switch.

The green LED alongside the ON Key glows for **5** seconds. You will then need to reset the Option and SW2/3 switches.

NOTE: Because all the flags are reset by this operation, the "Flag F" (addressed at "DF) which determines the choice between "Projector" and "Flat Panel" control, is reset to "00", the value selection "Projector". This must be set to "01" if the controller needs to run a flat panel.

Readout of Software Version Number

(The version number display changed after rev V100 to allow for a three-digit version number display. Three digits are now displayed as a Green-Red-Green sequence for Hundreds-Tens-Units of the version no, and a "zero" in the number is shown as a very brief "blip" (2-milliseconds), whereas a digit is ½ a second with a ½ second gap.)

- Set the "Program select" switch to FE hex;
- Turn off all Option-switches; and
- Push the "Reset" switch.

The green LED flashes for the Hundreds of the version number, then the Red Off LED flashes for the Tens, then the Green flashes again for the UNITs of the version number. Flashes are 1 second apart.

The right-hand (green) LED also shows whether the loaded software is for a projector or a flat panel. If the green LED flashes on for 5 seconds after the three flash periods above, it is a flat panel setting, if NO green for 5 seconds, it is a projector setting.

You will then need to reset the Option and SW2/3 switches (and press RESET again).

OPT7: Detection of projector shutdown

If Option Sw7 is ON, then the projector will be polled by the T430 every 5 seconds for its run state. If the projector has been turned OFF (either manually via the projector-top buttons, the projector IR remote or because of a timeout with no signal, etc) the T430 will detect this and will also follow state to show the OFF LED glowing. To test this, select SW7 on, do a "reset" via the reset switch and then run the system. Then disconnect the projector, and the system should close down after three failed polls (15-20 seconds). OPT7 reply mode only starts after the system has been ON for 6 minutes, to allow for slow warmup or projectors that have fast turnoff, but then delay turnon.

Configuring the T430

Using the projector channel codes:

In part B of this manual, hex or ASCII commands strings are shown for each available source in a projector/panel.

You don't ever have to put the hex strings into the device ... they are just shown for illustration and so you can compare them against the strings in a projector manual. (We do this because often projectors call things by different names on different models. Having the strings helps you choose an appropriate string, when they need setting.)

We preset the strings used for the "Computer 1" and "Computer 2" selection as defaults to be the first two entries in the Computer strings table on the page for each projector family:

So to use the Sony example, the first two strings are:

Computer1 := A9 + 00 + 01 + 00 + 00 + 02 + 03 + 9A; // Input A VGA analog-RGB
Computer2 := A9 + 00 + 01 + 00 + 00 + 03 + 03 + 9A; // Input B or Component

and these are the defaults for the "Computer1" and "Computer2" keys . Whenever there is a DB15 connector we make this "Computer 1".

Same with video: their default strings are:

Video1 := A9 + 00 + 01 + 00 + 00 + 00 + 01 + 9A; // Composite Video RCA
Video2 := A9 + 00 + 01 + 00 + 00 + 01 + 01 + 9A; // S-Video

so the default Video1 selection is just about always Composite on a RCA connector and Video2 (if there is one) is S-Video.

So the default first two "Computer" and "Video" strings are automatically setup

Bonus: To make it VERY easy to swap S-Video for Composite Video, we have setup the OPT1 switch to just swap over Video1 and Video2 allocations. Set the switch and press the Reset switch.

We always put all the strings we can find for a particular family into the internal system data base, and one can just select which one of the pre-coded strings you want to use, by PUTTING ITS INDEX NUMBER **ALONE** INTO THE CONSTANT LOCATIONS 0, 1, 2 AND 3.

So if you want the string called: *Computer4 := A9 + 00 + 01 + 00 + 00 + 05 + 05 + 9A; // Input D or DVI*

to be the string used for the Computer1 key on a T430, simply put its index (i.e. "4") into the "Constant:0" location (as shown on page 4 of the manual, using a switch setting of E0 on the Program Select switch and 00000100 on the Options switch).

If OPT4 is set, and you are running between two computer sources, the second computer source can be programmed for one of the other "Computer" choices by putting its index number into Constant:1 (program select switch = E1).

Reprogramming the T430 CPU

The T430 allows easy updates of the firmware to be downloaded from a PC using the JED AV Downloader 1.1 program. The connections to a female D9 to the computer serial port are:

T430 Projector port	**D9 serial port connection to computer**
Ground	Pin 5
Tx	Pin 2
Rx	Pin 3

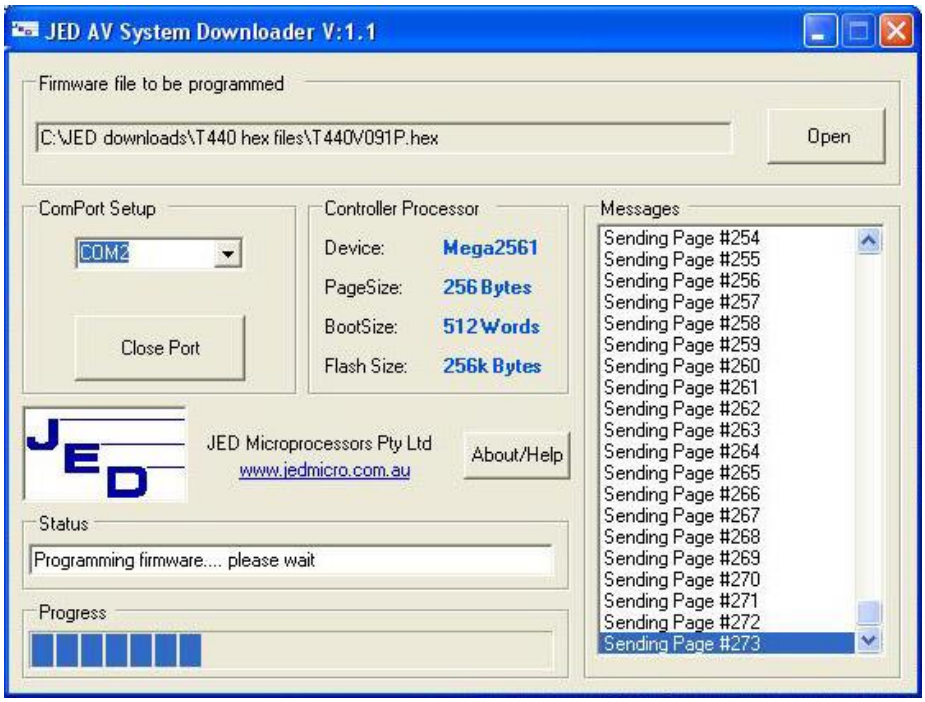
Initial PC setup for downloading

The following steps need to be performed to setup your PC for the reprogramming task :

1. Download and install the JED AV Downloader 1.1 from http://www.jedmicro.com.au/T440.html
   Note the Microsoft .NET Framework software will need to be installed on the PC
2. Email or call JED at tech_support@jedmicro.com.au for the latest T430 firmware file

Doing the reprogramming

1. Open the JED AV Downloader 1.1 icon on your desktop to run the downloader:



2. In the window "Firmware file to be programmed", click on "Open" and navigate to the saved firmware file.

3. In the “ComPort Setup” window select the COM port number on your PC that you have connected to the T430. *The COM port can be found under “My Computer” - “Properties” - “Hardware” - “Device Manager” - “Ports(COM & LPT).*
4. The status window should show “Ready, Waiting for AV Controller”;
5. Plug the cable into the T430 Projector port.
6. Momentarily press the T430 “Reset” switch
7. In the “Messages” window, the “Sending Page #nnn” scrolls as each 128 byte page is erased, sent and verified. The final message should be: “Firmware Prog Done”.

If it fails to program or stops prematurely, push the RESET switch again.

NOTE: The T430 settings may be reset to the default Projector control. Change Flag F if Flat panel/LCD control is required.

Wiring the T430

There is a wiring diagram on the last page of this manual (Part A)

Use of CAT5 wiring plugged into RJ45 socket J6 (See page 4 diagram)

Most commonly, CAT5 cable is used for T430 to projector wiring. It is important to use the CAT5 as a series of pairs, where there is an active line (solid colour) paired with a twisted mate (same colour with white). Please make sure the ground pins of signal cable pairs are connected **at both ends, particularly with RS232 TX and TX lines.**

Use the following coloured wires for the listed functions, as in the following table: (**Note: This allocation has changed from earlier recommendations but is now preferred so as to match the new T447 "Cable Top Box" automatic pair allocations using a standard EIA568-A cable, either using an off-the-shelf cable with a CAT-5 connector at BOTH ends, or if a cable is cut, the following are the colour codes this cable should pin out with. Please switch to using this even if it is NOT plugged into the T430 CAT-5, J6 connector, so as to stay compatible.** We have occasionally seen what claims to be an EIA568-A cable actually having different colours, so please do a quick multimeter check on continuity back to the T430 to make sure of coding, e.g. check Gr/Wh goes to power positive In, and check coms from Blue/Wh to J5 Tx out and Brown/Wh to J5 Rx In. Check grounds to Blue, Brown and Green.

If plugging directly into a T447 CAT5 to CAT5 obviously colour does NOT matter, but don't use a crossover CAT-5.

Green/white	+ supply feed via CAT5	Green	Ground to 2-pin power connector
Orange/white	CTS (+9 volts) from T430 to proj. *** **ALWAYS include to future-proof the installation**	Orange	PIR link for people-sensing. The PIR relay connects to ground and OPENs when people are detected.
Blue/white	Tx RS232 from T430 to proj. (or IR LED positive if link L1 is in IR position)	Blue	Ground to Proj. RS232
Brown/white	Rx RS232 from Proj. To T430	Brown	Ground to Proj. RS232

Trouble-shooting guide to setting up a T430

These notes are to guide debugging if an installation does not come to life on initial hook-up.

Firstly: Make sure the switches are set correctly, and make sure you have pressed the Reset switch after setting.)

Initial test using "blink codes"

1. A basic self-test is included in most projector/panel drivers, and this can be actioned simply by pressing the **OFF** key when in the OFF state (just the red LED lit and the projector OFF.
   If this self-test mode is available, the notes for the projector included on the particular projector page is indicated by the following message: "*Power on panel connection blink codes are provided*"
2. If "blink codes" are available, the red LED should blink just once, and then show a steady OFF. This means the projector has been polled for status by the T430 and it has replied with a correct "*I'm here and I'm OFF*" message.
3. If "blink codes are available, and the red LED blinks three times and then shows a steady OFF, it indicates there is a communication error, and the correct reply was NOT received back from the projector.

(If there are no "blink codes" provided for that projector, the red LED just comes on steady at all times after reset or pressing OFF. If the red LED comes on continuously, but the projector **does** have blink codes, you may have a wrong or invalid projector code set on SW2/SW3.)

If both LEDs flash in step, this indicates an invalid SW2/3 program select setting.

Projector baud rate setting

Successful RS232 communications requires that both the controller and the projector are set up with the same baud rate (i.e. communications speed.)

In the Part B manual, we specify what baud rate the controller assumes … this is normally the default baud rate as a projector is unpacked from the factory. If this has been altered because the projector was possibly used for a demonstration, on a network rather than via RS232 or if the projector has not been manually set from some much higher baud rate **YOU WILL HAVE TO SET THE BAUD RATE BEFORE USE.**

On some others, you will need to select **RS232** from the choice of **"RS232 or USB"** control, or from **"RS232 or network"** control.

Note particularly:

NEC projectors often have three or four rates, and are sometimes delivered with different rates. Sometimes two different rates are specified on two different versions of the "installation guide" from NEC. Check the menu.

Sony have some with different parity settings, so make sure the correct controller code is used.

BenQ (especially older ones) sometimes have to have the RS232 enabled in a hidden menu accessible only via a secret "factory setup" menu.

Taxan projectors need the baud rate reset to a lower value before use. See the part B manual for codes to do this.

Projector "Eco" etc settings

New energy-saving regulations require manufacturers to have low power consumption in the standby (or Off) state, and some projector makers actually disable RS232 communications in this low-power state, which makes it hard to wake it up and turn it on!

Installers must disable these low power options to successfully turn a unit on. Check the projector manual for these settings. Basically, you must choose the lowest-powered setting that works.

Voltage tests on projector RS232 connection

You will need a multimeter as a basic piece of test equipment.

1. Set MM to "Volts" and with the black lead on Gnd (far right, back view), check voltages on "Tx" and "Rx". It should be -5 to -9 volts on almost all projectors. (exceptions are projectors with clamp diodes on their serial ports. If you have one of those, you will get about -0.5 to – 1 volts on these lines);
2. If only ONE line is at -5 to -9 volts, suspect a wiring fault. Correct the wiring and try again. Maybe Tx and Rx are swapped;
3. If voltages are correct, unplug the cable from the Phoenix connector and measure voltage from the Tx line to ground. If this is still negative of more than a few millivolts, check wiring for a short to the projector's Tx line. Else measure resistance to Gnd … it should be 4 to 7 KOhms. If it is only a few ohms, suspect a short to ground. If it is high or open circuit, you are NOT connected to the projector RS232 input. Correct the wiring and try again.
4. Some (very few) projectors need a CTS line set at a +9 voltage. This may be the problem, but is most unusual.

Projector "Source lock" and "Auto-search" settings

Successful RS232 communications requires the projector does NOT use its own decision-making to change channels.

If a selection item in the projector menu called **"Source Lock"** exists, it should be set to **ON,** which means that the projector will stay on a selected channel when set via RS232 to that channel (and not wonder off to find some other channel with a signal and lock onto that.)

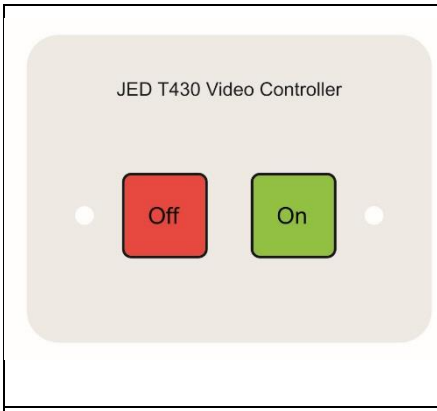
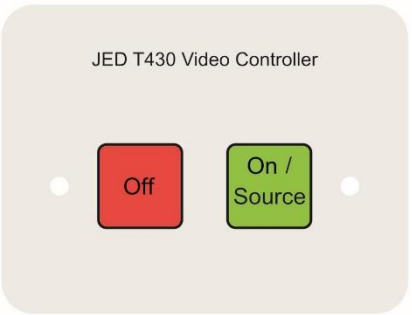
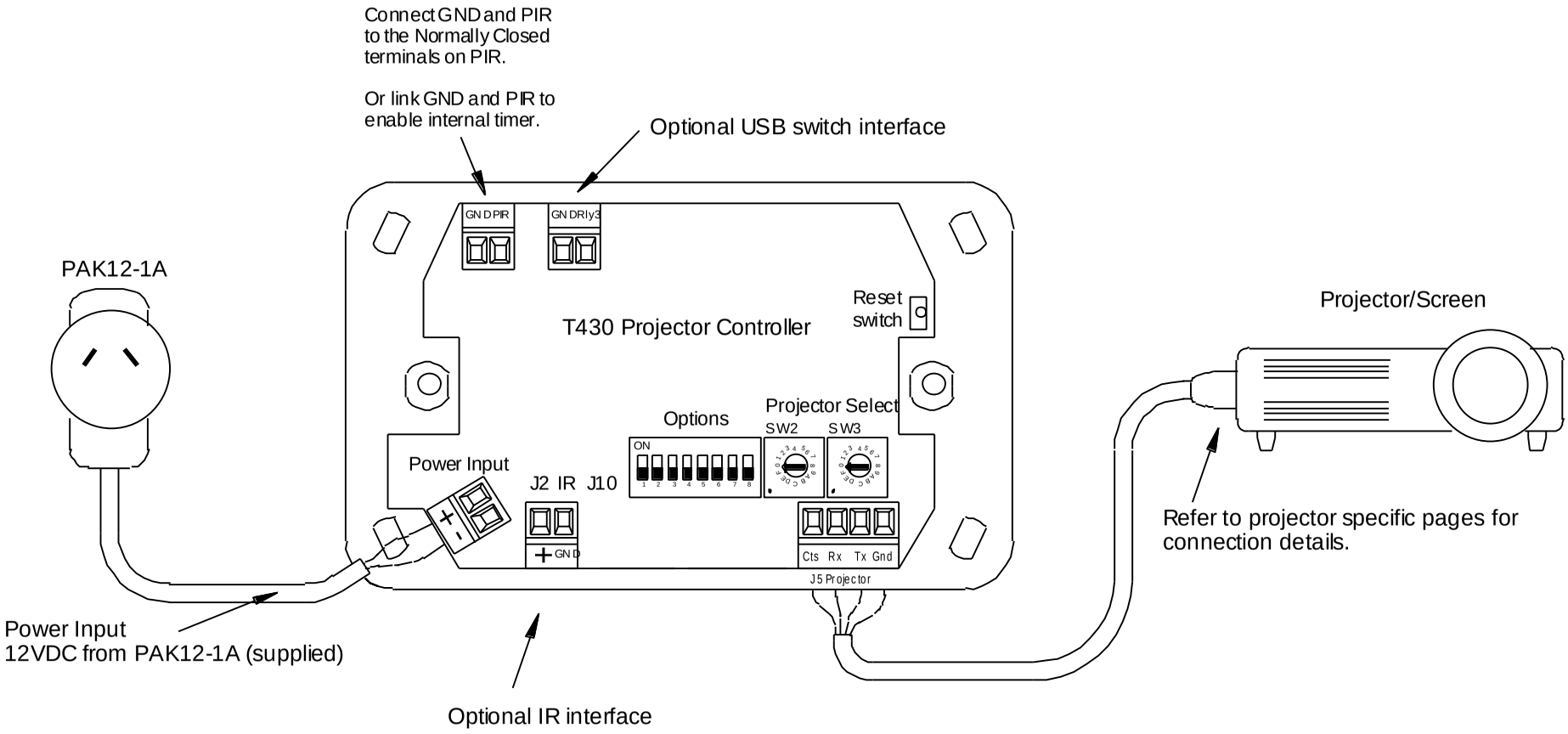
If a selection item in the projector menu called **"Auto-search"** exists it should be set to **OFF** (as we are commanding sources from the JED controller).

Both LEDs flashing: What's the problem?

If you find this happening the problem is simply that you have not selected a valid projector code on Sw3/4.

This warning tells the installer to select a valid code from the Part-B of the manual.

Keyboard options:

	
T430-KB1	**T430-KB3**

T430 Wiring Details