

KEYPAD16 AND KEYPAD20

REMOTE CONTROLLERS

Instruction and Technical Manual



**KNOX VIDEO
TECHNOLOGIES**
8547 Grovemont Circle
Gaithersburg, MD 20877
TEL 301•840•5805
FAX 301•840•2946
www.knoxvideo.com

Limited Warranty

Unless otherwise stated in the product specific documentation received with this product, Knox Video Technologies provides a five-year limited warranty for this product. The above warranty period shall begin on the date of shipment by Knox to purchaser or, if purchaser is an authorized reseller of such Knox products, from the date of shipment by the reseller to the reseller's original customer.

The warranty set forth above shall not apply to failure or deficiency which has been caused by misuse, abnormal or unusually heavy use, neglect, alteration, improper installation, unauthorized repair or modification, improper testing, accidental or causes external to the product such as but not limited to excessive heat or humidity, power failure, or improper installation.

IF SERVICE IS REQUIRED:

If the product does not perform as warranted, call Knox Video Technologies at 301-840-5805 for available service options.

If it is necessary to return an item to Knox, the defective product should be securely packaged in original boxes and insured for shipment. Owner agrees to insure and accept all liability for loss of or damage to this product.

YOU MUST CALL TECHNICAL SUPPORT AT 301-840-5805 FOR A RETURN AUTHORIZATION NUMBER (RA) AND "SHIP-TO" ADDRESS BEFORE SHIPPING ANY PRODUCT TO KNOX.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.



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Warnings, Cautions and Others

Mises en garde, précautions et indications diverses

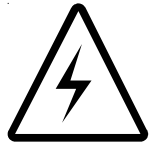


CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION

To reduce the risk of electrical shocks, fire, etc.:

1. Do not remove screws, covers or cabinet.
2. Do not expose this appliance to rain or moisture.

ATTENTION

Afin d'éviter tout risque d'électrocution, d'incendie, etc.:

1. Ne pas enlever es vis ni es panneaux et ne pas ouvrir le coff ret de l'appareil.
2. Ne pas exposer l'appareil a la pluie ni a l'humidité.

Caution — STANDBY/ON switch!

Disconnect the mains plug to shut the power off completely. The STANDBY/ON switch in any position does not disconnect the mains line. The power cannot be remote controlled.

Attention — Commutateur STANDBY/ON!

Déconnecter la fiche de secteur pour couper complètement le courant. Le commutateur STANDBY/ON ne coupe jamais complètement la ligne de secteur, quelle que soit sa position. Le courant ne peut être télécommandé.

For U.S.A.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

For Canada/pour le Canada

CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION: POUR EVITER LES CHOCS ELECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

For Canada/pour le Canada

THIS DIGITAL APPARATUS DOES NOT EXCEED THE CLASS B LIMITS FOR RADIO NOISE EMISSIONS FROM DIGITAL APPARATUS AS SET OUT IN THE INTERFERENCE-CAUSING EQUIPMENT STANDARD ENTITLED "DIGITAL APPARATUS," ICES-003 OF THE DEPARTMENT OF COMMUNICATIONS.

CETAPPAREIL NUMERIQUE RESPECTE LES LIMITES DE BRUITS RADIOELECTRIQUES APPLICABLES AUX APPAREILS NUMERIQUES DE CLASSE B PRESCRITES DANS LA NORME SUR LE MATERIEL BROUILLEUR: "APPAREILS NUMERIQUES," NMB-003 EDICTEE PAR LE MINISTRE DES COMMUNICATIONS.

CAUTION:

- Do not block the ventilation openings or holes.
(If the ventilation openings or holes are blocked by a newspaper or cloth, etc., the heat may not be able to get out.)
- Do not place any naked flame sources, such as lighted candles, on the apparatus.
- When discarding batteries, environmental problems must be considered and local rules or laws governing the disposal of these batteries must be followed strictly.
- Do not use this apparatus in a bathroom or places with water. Also do not place any containers filled with water or liquids (such as cosmetics or medicines, flower vases, potted plants, cups, etc.) on top of this apparatus.

ATTENTION:

- Ne bloquez pas es orifices ou es trous de ventilation.
(Si es orifices ou es trous de ventilation sont bloqués par un journal un tissu, etc., la chaleur peut ne pas être évacuée correctement de l'appareil)
- Ne placez aucune source de flamme nue, telle qu'une bougie, sur l'appareil.
- Lors de la mise au rebut des piles, veuillez prendre en considération es problèmes de l'environnement et suivre strictement les règles et les lois locales sur la mise au rebut des piles.
- N'utilisez pas cet appareil dans une salle de bain ou un autre endroit avec de l'eau.
- Ne placez aucune récipient contenant de l'ear (tel que des cosmétiques ou des médicaments, un vase de fleurs, un pot de fleurs, une tasse, uec.) sur cet appareil.

SECTION 1. GENERAL INFORMATION

1.1 INTRODUCTION

The Knox Keypad16 and Keypad20 Remote Controllers are RS232 terminal devices which are designed to control the Knox Video line of audio/video routing switchers from remote locations via three-wire hookup or modem.

1.2 TECHNICAL DESCRIPTION

The Keypad Controllers are mounted in a 5" by 7" desktop case, approximately 1 1/2 inches high, or in a 3U rackmount panel. In the Chameleon series they may be mounted on the front panel. They have two DB9 connectors, one male for RS232 OUT (downstream) to the Knox routing switcher to be controlled, and one female for RS232 IN (upstream) from another Knox controller or other RS232 terminal device.

Power is supplied from a wall plug-in module (or from the Chameleon's internal power supply) which provides dc power at eight to twelve volts at approximately 250 mA.

1.3 DETAIL SPECIFICATIONS

Dimensions:	slope-fronted desktop housing 7" w x 5" d x 1 1/2" h, or 5/4" x 19" rackmount panel
Power supply:	8 vdc nominal at 250mA absolute maximum voltage: 16 vdc
Power connector:	5mm/2mm coaxial, tip negative, or .025 square two-pin connector, .1" spacing, top positive
RS232 connectors:	DB9P (male) to routing switcher DB9S (female) to terminal device
Controls:	16- or 20-key keypad
Display:	2 line x 24 character LCD
Shipping weight:	2 pounds

SECTION 2. INSTALLATION

2.1 INTRODUCTION

This section provides the information required for installation of the Keypad Remote Controller into its operating environment.

2.2 UNPACKING AND INSPECTION

Unpack the Keypad Controller carefully and verify that the serial number matches the number quoted on the packing list. Before installing it into a system, check the outside of the unit carefully for signs of damage and check that none of the fasteners have come loose.

2.3 INSTALLATION

The Keypad Controller is designed to sit on a desktop or to be mounted in a standard 19" rack.

To connect the controller to any of the Knox Video routing switchers, connect a three-wire cable with a DB9 female at the Keypad end and a DB9 male at the router end. Connect the cable pin-for-pin to DB9 pins 2, 3, and 5. See setup information below.

The Keypad transmits at 9600 baud, so be sure the Knox router is set to receive at 9600 baud.

The Keypad can also receive commands from upstream and relay them to the Knox router. To connect an upstream device, connect a three-wire cable with a DB9 male at the Keypad end and an appropriate connector (a DB9 female if the upstream device is another Knox Remote Controller) at the upstream device end. Connect the cable so that, at the Keypad end, data from the upstream device is connected to pin 3 and data to the upstream device is connected to pin 2; pin 5 is ground (common).

2.4 SETUP COMMANDS; SELECTING THE ROUTER

Normally the Keypad is set up to control the router you specified at the time the order was placed. But in the event of a change in routers, or if the battery backed-up memory has failed to retain that information, you can select the Knox router by the following commands:

Push the S (STORE) key, then 93. Enter 1 for the RS4x4, 2 for the RS8x8, 3 for the RS16x16, 4 for the Chameleon64, or 5 for the ChameleonHB or Chameleon256.

If being used for the first time, or in the event of a complete memory loss, there will be nonsense characters in both the current crosspoint pattern map and the twenty stored patterns. To reinitialize these, push the S (STORE) key, then 94. Enter 1 then push the ENTER key to reinitialize, or push 0 and ENTER to quit.

CAUTION -- reinitializing erases all of your stored patterns!

SECTION 3. OPERATION

3.1 INTRODUCTION

This section explains in detail the operation of the Keypad Controllers.

3.2 CONNECTIONS AND SETUP

Connect and configure the Keypad Controller via the RS232 cable as described in Sections 2.3 and 2.4.

3.3 SELECTING THE MODE

The Keypad Controllers can operate in one of four modes: (1)Full Matrix, (2)Single Output, (3)Strings, and (4)Recall. To select the mode, push the Mode switch (in the Keypad16, push the S key, then 83, then ENter), then a number from 1 to 4. The current mode will be indicated in the scrolling display.

Mode 1: Full Matrix -- in this mode all the functions of the router switcher may be controlled by the remote; any input may be routed to any output, and the pattern storage, recall, and timed operation can be invoked.

Mode 2: Single Output -- in this mode the controller has been assigned to control a single output; pattern storage, recall, and timed operation cannot be invoked in this mode.

Mode 3: Strings -- in this mode the controller sends one of up to 64 preprogrammed strings of ASCII characters to the router. Normally these would be a series of commands to put some of the router outputs in a predetermined position. Strings can be entered from the keypad or from an upstream terminal.

Mode 4: Recall -- in this mode the controller can only be used to recall the stored patterns.

3.4 FULLMATRIX MODE

3.4.1 HOW TO ROUTE AUDIO AND VIDEO IN ONE COMMAND

To route audio and video from the same input, push the B (BOTH) key on the front panel controller, then a one- to three-digit number for the output you wish to route to, then a one- to three-digit number for the input you wish to route both audio and video from, then push the ENTER key. (Note: use only one digit for the RS4x4 and RS8x8 routers, or two digits for the RS16x16 and Chameleon64.)

RS4x4, 8x8, or 16x16 only: To route audio and video from different inputs, push the B key, then an output number, then a video input, then an audio input, and then push the ENTER key. (Note: use only one digit for the RS4x4 and RS8x8 routers, or two digits for the RS16x16.)

To route nothing to an output, just enter a 0, 00, or 000 for the input number (use a 0 for the RS4x4 and RS8x8 routers, or 00 for the RS16x16).

After the first B command has been executed, it is not necessary to push the B before the output and input numbers on subsequent commands.

3.4.2 HOW TO ROUTE VIDEO ALONE

To route video alone, push the V (VIDEO) key, then a one-, two-, or three-digit number for the output you wish to route to, then a one-, two-, or three-digit number for the input you wish to route from, then push ENTER. (Note: use only one digit for the RS4x4 and RS8x8 routers, or two for the RS16x16.)

After the first V command has been executed, it is not necessary to push the V before the output and input numbers on subsequent commands.

3.4.3 HOW TO ROUTE AUDIO ALONE

To route audio alone, push the A (AUDIO) key, then a one-, two-, or three-digit number for the output you wish to route to, then a one-, two-, or three-digit number for the input you wish to route from, then push ENTER. (Note: use only one digit for the RS4x4 and RS8x8 routers, or two for the RS16x16.)

After the first A command has been executed, it is not necessary to push the A before the output and input numbers on subsequent commands.

3.4.4 HOW TO STORE A CROSSPOINT PATTERN

RS16x16HB, RS8x8HB, or RS4x4HB: To store the current pattern into the router's pattern memory, push the S key, then a two-digit number from 01-16 (one digit for the RS8x8HB or RS4x4HB), then push the ENTER key. (There are 16 patterns in the RS16x16HB, 8 in the RS8x8HB, and 4 in the RS4x4HB.)

The Keypad Controller also has the ability to store up to twenty complete crosspoint patterns in its local memory. As crosspoints are being made on the front panel controller, or from an external RS232 device, they are stored in the current crosspoint map. That map can be stored at any time in one of twenty available locations: Push the S key, then 80, then a two-digit number from 01 to 20, then the ENTER key. Note: the pattern previously stored at that location will be overwritten.

Chameleon64: To store the current pattern into the router's pattern memory, push the S key, then push the ENTER key. (There is only one stored pattern in the Chameleon64.)

The Keypad Controller also has the ability to store up to twenty complete crosspoint patterns in its local memory. As crosspoints are being made on the front panel controller, or from an external RS232 device, they are stored in the current crosspoint map. That map can be stored at any time in one of the twenty available locations: Push the S key, then 80, then a two-digit number from 01 to 20, then the ENTER key. Note: the pattern previously stored at that location will be overwritten.

ChameleonHB or Chameleon256: To store the current pattern into the router's pattern memory, push the STORE key, then a two-digit number from 01-20, then push the ENTER key. (There are 20 patterns in the CPU card in the ChameleonHB and the Chameleon256.)

The Keypad Controller also has the ability to store up to twenty complete crosspoint patterns in its local memory. As crosspoints are being made on the front panel controller, or from an external RS232 device, they are stored in the current crosspoint map. That map can be stored at any time in one of the twenty available locations: Push the STORE key, then 80, then a two-digit number from 01 to 20, then the ENTER key. Note: the pattern previously stored at that location will be overwritten.

3.4.5 HOW TO RECALL A STORED PATTERN

RS16x16HB, RS8x8HB, or RS4x4HB: To recall one of the stored patterns from the router's memory, push the R key, then a two-digit number from 01-16 (one digit in the RS8x8HB or RS4x4HB router), then push ENTER. (There are 16 stored patterns in the RS16x16HB, 8 in the RS8x8HB, and 4 in the RS4x4HB.)

The Keypad Controller also has the ability to store up to twenty complete crosspoint patterns in its local memory. To recall one of the twenty available patterns, push the S key, then 81, then a two-digit number from 01 to 20, then the ENTER key.

Chameleon64: To recall the stored powerup pattern from the router's memory, push the R key, then push ENTER.

The Keypad Controller also has the ability to store up to twenty complete crosspoint patterns in its local memory. To recall one of the twenty available patterns, push the S key, then 81, then a two-digit number from 01 to 20, then the ENTER key. Updating the entire pattern can take up to 30 seconds.

ChameleonHB or Chameleon256: To recall one of the twenty stored patterns from the router's memory, push the RECALL key, then a two-digit number from 01-20, then push ENTER.

The Keypad Controller also has the ability to store up to twenty complete crosspoint patterns in its local memory. To recall one of the twenty available patterns, push the STORE key, then 81, then a two-digit number from 01 to 20, then the ENTER key.

3.4.6 HOW TO TURN A CROSSPOINT OFF

Sometimes it is helpful to be able to disconnect a crosspoint altogether; that is, have nothing connected to an output. To turn an output off, use zeros for the input number: e.g., type a letter (B for both, A for audio, or V for video), then a one-, two-, or three-digit output number, then 0, 00, or 000 respectively, then ENTER. To turn the output back on, route any input to it. (Enter just a 0 for the RS8x8 or RS4x4, or 00 for the RS16x16 and the Chameleon64, or 000 for the ChameleonHB and the Chameleon256, then ENTER.)

3.4.7 HOW TO SEND A SALVO COMMAND

Sometimes you want to send the same input to a range of consecutive outputs; this is called a salvo. To send a salvo command, push the SALVO mode button (in the Keypad16 push the S key, then 95, then ENTER), then select BOTH, VIDEO, or AUDIO, and enter one to three digits for the first output in the range, then one to three digits for the last output in the range, then enter one to three digits for the input number to route from, and push ENTER. All the outputs in the range will then be connected to the input named. Note that the display will show an X for BOTH, a Y for VIDEO, and a Z for AUDIO -- this denotes that the controller is in the Salvo mode. (Note: use one-digit input and output numbers for the RS4x4 and RS8x8, two-digit numbers for the RS16x16 and Chameleon64, and three-digit numbers for the ChameleonHB and Chameleon256.)

3.4.8 HOW TO USE THE QUEUE COMMAND

Sometimes it is important to have a number of switches made all at the same instant. It is possible using the keypad controller to queue a number of pattern changes ahead of time, then to have them all executed at once. Push the QUEUE button (in the Keypad16 push the S key, then 99, then ENTER), then enter crosspoint changes as usual, selecting BOTH, VIDEO, or AUDIO, and entering the output and input numbers followed by the ENTER key. Note that the display will show an E for BOTH, an F for VIDEO, and a G for AUDIO -- this denotes that the controller is in the Queue mode. Each change will be recorded at the routing switcher, but the changes will not take place until the QUEUE button is pushed a second time, or if a change is made at the router's front panel controls. The Chameleon64 does not support Queue. (Note: use one-digit input and output numbers for the RS4x4 and RS8x8, two-digit numbers for the RS16x16, and three-digit numbers for the ChameleonHB and Chameleon256.)

3.4.9 HOW TO INTERROGATE A CROSSPOINT CONDITION

To determine the condition of a particular crosspoint, enter the Display Mode by pushing the DISPLAY key (in the Keypad16, push the S key, then 96). Then enter a one-, two-, or three-digit output number, and push ENTER. The LCD display will show all the crosspoints two at a time, beginning at that output number. Push the ENTER key to see more outputs; the display will return to READY after a few seconds if no more ENTERs are pushed. To repeat the last output queried, push the DISPLAY button followed by the ENTER button. To display the entire map just push the DISPLAY key (in the Keypad 16, push the S key, then 96) and push ENTER. Push the ENTER key to advance through the crosspoints.

3.4.10 HOW TO USE THE TIMED PATTERN RECALL MODE (RS Series, ChameleonHB, and Chameleon256)

The controller can be programmed to recall the crosspoint patterns stored in the router at timed intervals. To turn the timed mode on, push the S (STORE) key, then enter 90, then push ENTER. The display will read TIMED MODE ON. To turn timed mode off, push S (STORE) key, then 91, then ENTER. The display will read TIMED MODE OFF, then return to the READY prompt after a few seconds.

To set the time between patterns, push the S (STORE) key, then enter 92. The display will prompt you for a time interval from 1 to 999; enter a one-, two-, or three-digit number and push ENTER. Each increment of time interval is about 1 second.

3.5 SINGLE OUTPUT MODE

3.5.1 SETTING THE OUTPUT STATION

In single-station mode, the output being controlled is listed on the scrolling display. To change the output push the S (STORE) key, then 82, then enter a one- to three-digit output number, and push ENTER.

3.5.2 HOW TO ROUTE TO THE SELECTED OUTPUT

Push the B (BOTH), V (VIDEO), or A (AUDIO), then enter a one- to three-digit number (one digit for the RS4x4 or RS8x8, two for the RS16x16 or Chameleon64, or three for the ChameleonHB and Chameleon256) representing the input you wish to connect to. It is not necessary to push ENTER (for the ChameleonHB and Chameleon256 you may optionally push a one- or two-digit number, then ENTER). After BOTH, VIDEO, or AUDIO has been pushed it is not necessary to push it again before subsequent commands.

To move between various inputs, it is possible to use the SALVO and QUEUE buttons to move up or down through the inputs. Push the SALVO button to move to the next higher input (or QUEUE to move to the next lower) and push ENTER to execute the command.

3.6 STRINGS MODE

In strings mode only the pre-programmed strings can be sent from the controller; thus only the numeric keys are used (the SALVO, QUEUE, B, V, A, S, and R buttons are not used). To send a string, enter the two-digit number from 01 to 64 for the string to be sent.

Simple strings may be entered from the keypad; more complex strings must be entered from an upstream terminal. From the keypad, in STRINGS mode, push the S key and a two-digit number between 01 and 64. Then enter the command exactly as you wish it to be sent (e.g., S01, then V1608), then push ENTER. The carriage return after the command will be appended automatically.

In storing ASCII strings from an upstream terminal, the command \$Sxx, where xx is a two-digit number from 01 to 64, must precede the actual string to be stored. Strings may contain any ASCII or HEX characters, but the HEX characters must be represented in brackets; e.g., <0D> for 0Dh (the carriage return function). No carriage return is appended, so each string must end with <0D> if a carriage return is desired. For example, if the terminal sends this sequence of characters:

```
$$S01B0101<0D>B2208<0D>B0401<0D>
```

string 01 will contain a command to connect output 1 to input 1, output 22 to input 8, and output 4 to input 1 for both video and audio.

To replace a string simply store a new string over the old one.

3.7 RECALL MODE

In recall mode only patterns stored in the router's memory can be recalled (the SALVO, QUEUE, B, V, A, S, and R buttons are not used). To recall a pattern, enter the two-digit number (one digit for the RS4x4 and RS8x8, no digits for the Chameleon64) of the pattern. It is not necessary to push ENTER.

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3.8 SUMMARY OF STORE-KEY FUNCTIONS

<u>Command</u>	<u>Function</u>	<u>Argument</u>
STORE80	Store local pattern	01-20
STORE81	Recall local pattern	01-20
STORE82	Output number for single station mode	01-64
STORE83	Set Mode	1=Full Function 2=Single Station 3=Strings 4=Recall
STORE84	--	
STORE85	--	
STORE86	--	
STORE87	--	
STORE88	--	
STORE89	--	
STORE90	Timed mode on	
STORE91	Timed mode off	
STORE92	Timed mode time	1-999
STORE93	Select router	1=4x4 2=8x8 3=16x16 4=Chameleon64 5=ChameleonHB and Chameleon256
STORE94	Clear patterns	No=0 Yes=1
STORE95	Salvo Mode on/off	
STORE96	Display current pattern	Enter to continue
STORE97	Interrogates for cards	Cham64 only
STORE98	Lock/unlock output	01-64
STORE99	Queue mode on/off	

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Additional keys on 20-key model:

- | | | | |
|----|-------------------------|-------------------|-------------------|
| 1: | Mode | 1=Full Function | |
| | Mode | 2=Single Station | |
| | Mode | 3=Strings | |
| | Mode | 4=Recall Patterns | |
| 2: | Salvo Mode on/off | | |
| 3: | Display current pattern | | Enter to continue |
| 4: | Queue Mode on/off | | |

3.9 OPERATING FROM AN UPSTREAM TERMINAL

Generally, commands from an upstream controller or terminal device are passed on through the Keypad Controller to the router to be acted upon, and generally, all responses from the routing switcher to the controller will be echoed upstream to the terminal device.

However, all commands preceded by a \$ are blocked. The STORE-key functions listed on the previous page can be activated from a terminal by adding the \$ in front of the command. The command arguments must be a part of the string from the terminal (e.g., \$\$8012 stores the current pattern into local pattern 12).

SECTION 4. MAINTENANCE

4.1 INTRODUCTION

No routine maintenance is required in the Keypad Controller.

4.2 SWITCH/JUMPER OPTIONS

For all normal operating modes of the Keypad Controller, WJ1 should be OFF and WJ2 should be ON.

J3 is used for programming the on-board CPLD. Do not connect anything to connector J3.