Keyboard Protocol for the Mini-Matrix

Two modes of operation will exist for the keyboard. The first mode is the operating mode, the second is the programming mode.

OPERATING MODE PROTOCOL

Polling for Present Devices:

The min-matix has three serial ports. Port 1 is for keyboard communication, port 2 is for visual switcher or keyboard communication, and port 3 is for receiver driver communication. Keyboard / visual switch devices are addressed from 0 to 15. The mother board poll command is [Device Address]Qa. On power up, and every five minutes, the mother board will query the keyboard port, and the visual switch / keyboard port to detect present devices. The device response is [DeviceAddress]AKa which informs the mother board of its presence. Since no more than four devices may be attached to a port, the mother board will quit polling on the port when four devices have been detected. If four devices are not present on a port, the mother board will continue polling until addresses 0 to 15 have been attempted. While polling the device addresses, the mother board records the address of each device present on the port.

Polling for commands:

After the five minute poll, the mother board will begin polling detected devices for messages. It is up to the keyboard / visual switch to know its address, and respond if polled. The messages from the keyboard can be of varying lengths from three to five bytes. The last byte of each command is always the lower case 'a' character. When the mother board polls the keyboard / visual switch, if the keyboard / visual switch has a message it sends it. If the keyboard / visual switch has no message to transmit it responds with AKa to complete the command handshake. The mother board responds with AKa, NAa, or NA[command byte]a. The AKa response is an acknowledgment. The NAa is negative acknowledge for an unrecognized command. The NA[command byte]a is a negative acknowledge for a recognized command. Instances where the NA[command byte]a negative acknowledge would be sent are if a keyboard tries to access an unavailable monitor or camera, or if a keyboard sends a ptz command to a camera that is unavailable. In these instances the command sent back from the mother board would be NAMa, and NA#a, or NA[PTZ byte]a respectively. PTZ bytes include L, R, U, D, T, W, O, C, N, and F.

Command Name	Command bytes	Description
Left	L a	Move camera left
Right	R a	Move camera right
Up	U a	Move camera up
Down	D a	Move camera down
Near	N a	Focus near
Far	F a	Focus far
Telephoto	T a	Zoom telephoto
Wide	W a	Zoom wide
Stop Left	~ L a	Stop Left
Stop Right	~ R a	Stop Right
Stop Up	~ U a	Stop Up
Stop Down	~ D a	Stop Down
Stop Near	~ N a	Stop Focus Near
Stop Far	~ F a	Stop Focus Far
Stop Telephoto	~ T a	Stop Zoom telephoto
Stop Wide	~ W a	Stop Zoom Wide
Aux on	[AUX] AUX A a	AUX ranges from 1 to 11*
Aux on key release	[AUX] AUX ~ A a	Release Aux key*
Aux off	[AUX] AUX B a	AUX ranges from 1 to 11*
Start Macro	MACRO S a	Macro ranges from 1 to 2
Alarm Acknowledge	[ALM] ALM I a	ALM two digits for 18 alarms
Go to preset	[PRE] PRE \ a	PRE two digits for 80 presets
Set preset	[PRE] PRE ^ a	PRE two digits for 80 presets
Start Sequence Forward	q a	Starts monitor sequence forward
Start Sequence Backward	b a	Starts monitor sequence backward
NEXT	+ a	Increment sequence camera
PREV	- a	Decrement sequence camera
Hold Sequence	e a	Put sequence in hold state
Select Monitor	MON M a	MON ranges from 1 to 4
Select Camera	[CAM] CAM # a	CAM two digits for 16 cameras
Go to Programming Mode	P a	Switch to programming mode
Enable Displays	[Type] d a	Turn on display *
Disable Displays	[Type] ~ d a	Turn off display*
Control Alarms	[ADR]l a	Visual Switcher controls alarms**
Disable Alarm Control	[ADR]~l a	Visual Switcher releases alarms***

*The ~Aa command is sent on release of one of the function keys. The different relay modes are keyed, momentary, and latching. In the keyed mode, the relay is turned off upon key release, and this makes the ~Aa command necessary. It is ignored if the relay has been programmed to be latching, or momentary. Also in order to control the min-matrix local relays, the numbers used are 9, 10, and 11. Numbers 1-8 are used to control receiver driver remotre relays.

**The Type byte of the display command is an ASCII Number from 1   to 5. 1da / 1~da enables/disables Camera Id number   2da / 2~da enables / disables camera titling 3da /
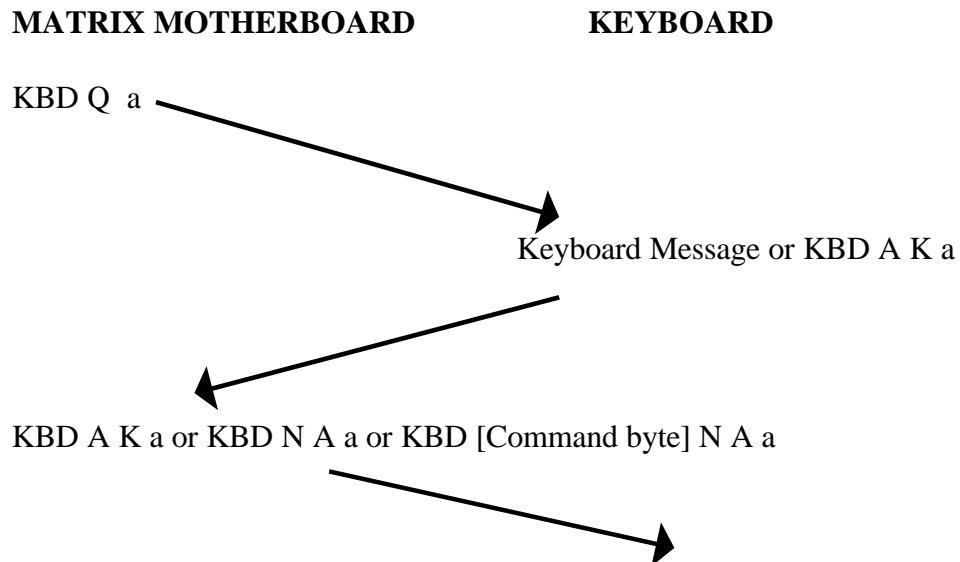
there is no type byte all displays are enabled / disabled for a monitor.

***The la command performs two functions. It disables all alarms on all monitors, and causes the mini-matrix mother board to report alarms to a visual switch device connected on port 2. The [ADR] byte is the address of a visual switch, and is the address used to report alarms to the visual switch. The format of an alarm reported to the visual switch from the mini-matrix mother board will be ADR [ALM] ALM E a where ADR is the visual switch address, [ALM] is the optional tens digit of the alarm number ALM is the ones digit of the alarm number. Alarms range from 1 to 18. There will be no acknowledgment expected from the visual switch.

Matrix Message to keyboard in operating mode

Command Name	*Command Bytes*	*Description*
Ack	KBD A K a	Message acknowledgment
Negative Ack	KBD N A a	Negative acknowledge unrecognized command
Negative Ack	KBD N A [Command] a	Negative acknowledge recognized command
Keyboard Poll	KBD Q a	Poll keyboard for new commands

Message Sequence in the operation Mode

MATRIX MOTHERBOARD   KEYBOARD

KBD Q a

                        Keyboard Message or KBD A K a

KBD A K a or KBD N A a or KBD [Command byte] N A a

There are a limited number of commands needed for programming the system. Their purpose is to move through the menus, and change various system settings.

Keyboard Messages to Matrix Programming Mode

Command	Command Bytes	Description
Number 0..9	NUM a	NUM is ASCII 0..9 for numeric entry
Right	R a	Select item to right
Left	L a	Select item to left
Up	U a	Select item above
Down	D a	Select item below
AUX ON	A a	Change selected item's value
AUX OFF	B a	Change selected item's value
ACK	I a	Select New Menu or Return

The mother board will send no acknowledgment message when the keyboard is in the programming mode.

Communication paramaters are Even parity, 8 data bits, one stop bit. Keyboards will transmit at 19,200 baud. Data rate on the keyboard / visual switch port is yet to be determined.

In this document I've placed spaces between command bytes for appearance. NO ASCII SPACE IS SENT FOR ANY COMMAND OF THE PROTOCOL.