

# Kalatel/GE-Interlux Protocol

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## 1 Kalatel RS-422 Protocol

On 30JAN07, Kalatel protocol was captured from a KTD-405 IO Box connected to a KTD-405 keyboard. The KTD-405 keyboard is similar to a KBD-300A, in that it has buttons and a joy stick. However it seems to be more capabil with its LCD display and some of the marked options of its buttons. There was no camera or any other Kalatel equipment connected.

1. The baud rate was 4800, 1 stop, no parity.
2. The data did not consist of “printable” ASCII characters.
3. Each message is 3 bytes long.
4. When nothing is present, messages are sent out continously with no gap inbetween each message. It is unclear what happens with something connected so as to provide replies.

In the below example note that the time between bytes is about the same as that provided by the transmission time of each byte.

From	Start	Delta	Time	Data
0.004586	0.002291	80		
0.006877	0.002291	00		
0.009168	0.002291	00		
0.011461	0.002293	80		
0.013752	0.002291	00		
0.016043	0.002291	00		
0.018331	0.002288	80		
0.020757	0.002426	00		
0.023048	0.002291	00		

5. A “no-data” message is: 80 00 00 and is sent constantly.
6. The three “no-data” messages above may be reformatted as follows:

From	Start	Delta	Time	Data
0.004586	0.002291	80 00 00		
0.011461	0.002293	80 00 00		
0.018331	0.002288	80 00 00		

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<sup>1</sup>\$Header: d:/TXB-Kalatel/Protocol/RCS/KProto.tex,v 1.1 2007-02-01 09:42:38-08 Hamilton Exp Hamilton \$

7. After the reformatting it is obvious that each message starts with a 0x80 and ends with a 0x00, with each message being three bytes in length.
8. When a command is sent, it consists of two or more three byte messages, as shown below:

From	Start	Delta Time	Data	Command Description
10.426697	0.002290	80 00 01	Command start	
10.433406	0.002124	a8 1f 00	Zoom +, keyboard key, Last Message	

In this short example, it should be noted that the third byte of the first message has been turned into a 0x01 from a 0x00 and the third byte of the last message is a 0x00.

9. The commands are repeated at about a 68 ms rate, as shown below.

From	Start	Delta Time	Data	Command Description
10.426697	0.002290	80 00 01	Command start	
10.433406	0.002124	a8 1f 00	Zoom +, keyboard key, Last Message	
10.495448	0.002458	80 00 01	Command start	
10.502310	0.002293	a8 1f 00	Zoom +, keyboard key, Last Message	
10.564184	0.002291	80 00 01	Command start	
10.571060	0.002293	a8 1f 00	Zoom +, keyboard key, Last Message	
10.632944	0.002300	80 00 01	Command start	
10.639808	0.002283	a8 1f 00	Zoom +, keyboard key, Last Message	
10.701684	0.002290	80 00 01	Command start	
10.708559	0.002291	a8 1f 00	Zoom +, keyboard key, Last Message	

10. When the required action requires that more than one thing be done at a time, then more three byte messages are sent with the last message having its third byte set to 0x00. All preeceding bytes have their third byte set to 01.

- (a) Three message commands:

From	Start	Delta Time	Data	Command Description
273.519055	0.002291	80 00 01	Command start	
273.525931	0.002293	a8 1f 01	Zoom +, keyboard key, not Last Message	
273.532804	0.002289	81 0d 00	Pan Right Last Message	
273.587806	0.002293	80 00 01	Command start	
273.594681	0.002459	a8 1f 01	Zoom +, keyboard key, not Last Message	
273.601555	0.002291	81 15 00	Pan Right Last Message	
273.656541	0.002291	80 00 01	Command start	
273.663417	0.002282	a8 1f 01	Zoom +, keyboard key, not Last Message	
273.670292	0.002291	81 1a 00	Pan Right Last Message	

(b) Four message commands:

From	Start	Delta Time	Data	Command Description
288.162041	0.002302	80 00 01	Command start	
288.168906	0.002292	88 1f 01	Tilt Up Not Last Message	
288.175779	0.002290	81 1f 01	Pan Right Not Last Message	
288.182656	0.002293	a0 01 00	Zoom -, keyboard key, Last Message	
288.230780	0.002291	80 00 01	Command start	
288.237656	0.002289	88 1f 01	Tilt Up Not Last Message	
288.244530	0.002336	81 1f 01	Pan Right Not Last Message	
288.251405	0.002291	a0 04 00	Zoom -, keyboard key, Last Message	

11. A “speed” of 0x00 appears to cause motion.
12. The range of speeds, in variable speed commands, is from 0x00 to 0x1F, for a total of 32 speed steps.
13. A “speed” of 0x00 appears to cause motion.
14. For variable speed messages the speed field is indicated in the second byte:
  - (a) 81 00 00 Pan Right Speed 0x00
  - (b) 81 01 00 Pan Right Speed 0x01
  - (c) 81 02 00 Pan Right Speed 0x02
  - (d) 81 03 00 Pan Right Speed 0x03
  - (e) Etc.
  - (f) 81 1c 00 Pan Right Speed 0x1c
  - (g) 81 1d 00 Pan Right Speed 0x1d
  - (h) 81 1e 00 Pan Right Speed 0x1e
  - (i) 81 1f 00 Pan Right Speed 0x1f

Note that all of these pan messages, shown here, are the “last”, or only, message of a command sequence. (Intermediate messages have their third byte set to 0x01.)

15. Detected and identified messages are:

In all of the following messages, the byte marked “ss” is a variable field that will vary from 0x00 *longrightarrow* 0x1f.

- (a) 80 00 01: Command start
- (b) 81 ss 00: Pan Right Last Message
- (c) 81 ss 01: Pan Right Not Last Message
- (d) 88 ss 00: Tilt Up Last Message
- (e) 88 ss 01: Tilt Up Not Last Message
- (f) 8a ss 00: Tilt Down Last Message
- (g) 8a ss 01: Tilt Down Not Last Message
- (h) 91 ss 00: Pan Left Last Message

- (i) 91 ss 01: Pan Left Not Last Message
- (j) a0 ss 00: Zoom - CCW, from the knob on the Joy Stick, Last Message
- (k) a0 ss 01: *not detected*, Zoom - CCW, from the knob on the Joy Stick, Last Message
- (l) a0 1f 00: Zoom -, from the keyboard key, Last Message
- (m) a0 1f 01: Zoom -, from the keyboard key, not Last Message
- (n) a1 00 00: Focus -, from the keyboard key, Last Message
- (o) a1 00 01: Focus -, from the keyboard key, not last message
- (p) a2 00 00: Iris -, from the keyboard key, last message
- (q) a2 00 01: Iris -, from the keyboardkey, not last message
- (r) a8 ss 00: Zoom + CW, from the knob on the Joy Stick, Last Message
- (s) a8 00 01: Zoom + CW, from the knob on the Joy Stick, not Last Message
- (t) a8 1f 00: Zoom +, from the keyboard key, Last Message
- (u) a8 1f 01: Zoom +, from the keyboard key, not Last Message
- (v) a9 00 00: Focus +, from the keyboard key, Last Message
- (w) a9 00 01: Focus +, from the keyboard key, not last message
- (x) aa 00 00: Iris +, from the keyboard key, last message
- (y) aa 00 01: Iris +, from the keyboardkey, not last message

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