

network keypad protocol



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1 General

This document refers to all nexgentec network keypad processor boards ever produced. The protocol is identical, although this software versions are supporting all commands:

- CH0.28 for hardware release 1.0,1.1
- 2.0.6 or later for hardware release 2.0 rev x

Before try to communicate, update the software as described in the software update manual

2 Supported network protocols

2.1 TCP

The network processor board module listens to port 23 for TCP connections. Multiple connections are allowed

2.2 UDP

UPD packets can be sent to port 10001, the replies and key press notifications are sent to the set UDP reply IP.

3 Protocol and timings

3.1 Timings, timeout

On default the network processor board assumes a communication event on TCP or UDP every 10 seconds. On timeout the keypad will show RED 20% and close the TCP connection. Therefore the control system or software should send a PING at least every 9 seconds. This timeout can be set with the SPTO command to a higher value if this timeout is too short

The network processor board queues up all received commands and walk trough them, FIFO. Single commands should be sent as single TCP or UDP packet, always waiting for the response of the keypad to send the next command. Multiple commands can be queued and sent in ONE TCP or UDP packet. Use Wireshark to see what your system is doing.

3.2 Protocol

The example table shows how the protocol is designed. Start and stop character must always be used. In the further documentation they not noted anymore.

Examples:

Command name	Start character (hex)	Command (string)	Button 001-008 / system or all buttons 000 (string)	Value (hex)	Stop character (hex)
Ping	07	PING	000		B3 0D 0A
Key press event	07	EKPB	001		B3 0D 0A
Set LED color	07	SLED	001	0000FF (RRGGBB)	B3 0D 0A

3.2.1 Start character

Every command and reply starts with the start character (hex) 07

3.2.2 Stop character

Every command and reply ends with the start characters (hex) B3 0D 0A

3.2.3 Key press event

The keypad is sending key press notifications automatically to all established connections

Keypad sends:

Sequence	Command	Button (number 001-008)	Value (hex)
On press	EKPB	001	01
On hold (after 500ms)	EKPB	001	01
On release	EKPB	001	02

3.2.4 Set LED color

The LED's of the colors can be set to discrete red, green or blue. No mix can be done due to a limitation of the universal bus keypad. The intensity of the LED's is set with the command "Set LED intensity", if the intensity is 0 the LED will not light up in the chosen color.
 Values that should be sent: 0-127 = LED off / 128-255 LED on in the matching color. If more than one color is set to on, red has the highest priority, followed by green. Blue has lowest.

Control system sends:

Explanation	Command	Button (number 001-008)	Value (hex RGB)
Set LED 1 to blue	SLED	001	0000FF
Set LED 2 to green	SLED	002	00FF00
Set LED 7 to red	SLED	007	FF0000

Keypad replies:

Explanation	Command	Button (number 001-008)	Value (hex RGB)
LED 1 is blue	RLED	001	0000FF

3.2.5 Get LED color

The LED's of the colors can be retrieved

Control system sends:

Explanation	Command	Button (number 001-008)	Value (hex RGB)
Get LED 1 color	GLED	001	

Keypad replies:

Explanation	Command	Button (number 001-008)	Value (hex RGB)
LED 1 is blue	RLED	001	0000FF

3.2.6 Set LED intensity

Using this command all LED's are set to the desired intensity. If the intensity is 0 the colors can be set but will be invisible.

Control system sends:

Explanation	Command	Button (000 = all buttons)	Value (hex)
Set LED intensity to 120	SBGN	000	78

Keypad replies:

Explanation	Command	Button (000 = all buttons)	Value (hex)
LED intensity is 120	RBGN	000	78

3.2.7 Get LED intensity

Get back the intensity of the LED's

Control system sends:

Explanation	Command	Button (000 = all buttons)	Value (hex)
Get LED intensity	GBGN	000	

Keypad replies:

Explanation	Command	Button (000 = all buttons)	Value (hex)
LED intensity is 120	RBGN	000	78

3.2.8 Set LED flash

The LED's can be set to flash. The color and intensity are not affected from this command. The first value defines the on time, the second the off time.

To stop the flashing:

- The off time must be set to 0, the on time higher than 0.
- A color must be set

The values are interpreted as 100 ms steps, to set a time 5 seconds the value 50 in hex(32) must be sent

Control system sends:

Explanation	Command	Button (number 001-008)	Value (hex on off)
Set LED 1 to on 5 second, off 2 seconds	SBLK	001	3214
Stop LED 1 flashing	SBLK	001	0100

Keypad replies:

Explanation	Command	Button (number 001-008)	Value (hex on off)
LED 1 flashes 5 second on, off 2 seconds	RBLK	001	3214

3.2.9 Get LED flash

To get the flash times the keypad can be queried:

Control system sends:

Explanation	Command	Button (number 001-008)	Value (hex on off)
Get flash times	GBLK	001	

Keypad replies:

Explanation	Command	Button (number 001-008)	Value (hex on off)
LED 1 flashes 5 second on, off 2 seconds	RBLK	001	3214

3.2.10 Get MAC

The MAC of the LAN chip can be retrieved

Control system sends:

Explanation	Command	Button (000 = system)	Value
Get MAC	GMAC	000	

Keypad replies:

Explanation	Command	Button (000 = system)	Value (hex)
MAC	RMAC	000	00 00 00 00 00 00

3.2.11 Get firmware version

The firmware version of the network processor board can be retrieved

Control system sends:

Explanation	Command	Button (000 = system)	Value
Get firmware version	GVER	000	

Keypad replies:

Explanation	Command	Button (000 = system)	Value (str)
Firmware version	RVER	000	1.00

3.2.12 Get Temperature

If a temperature sensor is connected the temperature can be queried. -99.9 means no sensor is connected

Control system sends:

Explanation	Command	Button (000 = system)	Value
Get temperature	GTMP	000	

Keypad replies:

Explanation	Command	Button (000 = system)	Value (str)
Actual temperature	RTMP	000	24.5

3.2.13 Set ping timeout

Sets the ping/idle connection timeout. Values 10-255 Seconds, in hex (0A-FF)

Control system sends:

Explanation	Command	Button (000 = system)	Value (hex)
Set ping timeout	SPTO	000	0A

Keypad replies:

Explanation	Command	Button (000 = system)	Value (str)
Actual timeout	RPTO	000	0A

3.2.14 PING

The connection should be checked from the control system in 9 seconds intervals by a ping after the last command.

Control system sends:

Explanation	Command	Button (000 = system)	Value
Ping	PING	000	

Keypad replies:

Explanation	Command	Button (000 = system)	Value
Ping	PING	000	

3.2.15 Set IP

This command sets the IP of the network processor board. This IP can be used then for HTTP, TCP and UDP communication

The example sets the IP 192.168.1.44

Control system sends:

Explanation	Command	Button (000 = system)	Value (hex)
Set IP	SDIP	000	C0A8012C

3.2.16 Set UDP reply IP

This command sets the reply IP for UDP packets.

The example sets the IP 192.168.1.100

Control system sends:

Explanation	Command	Button (000 = system)	Value (hex)
Set UDP Reply IP	SUIP	000	C0A80164

Keypad replies:

Explanation	Command	Button (000 = system)	Value
UDP IP	RUIP	000	

