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1. General

The XT Push Button interface is a 4-channel push button interface with buttonLED control. Push buttons are a proven and robust way for users to provide input and navigate through digital content. The XT Push Button interface enables you to connect up to 4 push buttons per X-talk channel to Nexmosphere's Xperience controllers. This document provides explanation of the available functionalities and instructions on how to install and integrate push buttons into your digital signage installation via the XT Push Button interface.

The information in this document is created for users who are familiar with the Nexmosphere API and are able to control a basic setup with a Nexmosphere API controller. If this is not the case yet, please read the general documentation on the Nexmosphere serial API first.

2. Product overview

The XT Push Button interface is available in 1 model:

	XT-B4N6
Interface push buttons	✔
Button LED control	✔
Cable length	180cm

XT-B4N6

The XT Push Button interface is a 4-channel push button interface with buttonLED control. Via JST-PHR-3 connectors, the XT-B4N6 can interface any push button to the Nexmosphere platform*. Furthermore, the interface can control 3.3V button LEDs. It can adjust the LEDs of all four buttons simultaneously or set each button to different lighting sequences.

Nexmosphere also offers several push buttons with pre-assembled cable and connector. See the Accessoires section on page 5 for more information.
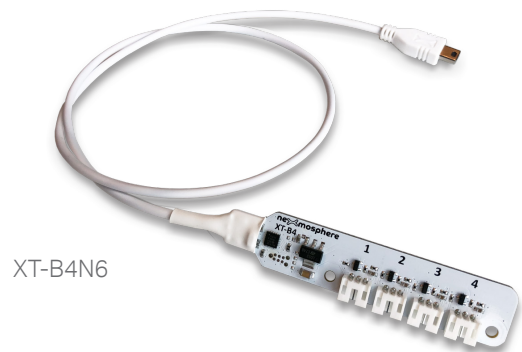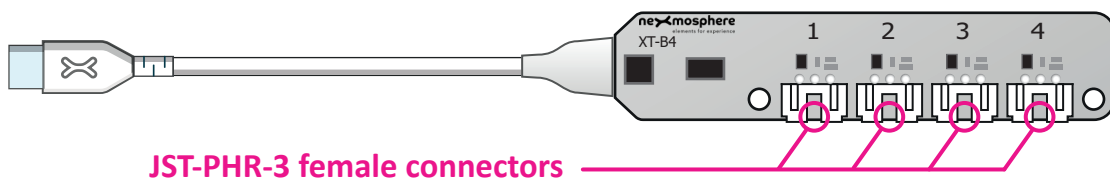
JST-PHR-3 female connectors

3. Functionalities and API commands

The XT Push Button interface provides the following functionalities:

1. **Push button input** - connect up to 4 push buttons and detect whether these are pushed or released
2. **Button LED control** - control the behavior of the push button's status LED

The following section will cover these functionalities in detail. Please note that for each API example in this document, X-talk interface address 001 is used (X001). When the sensor is connected to another X-talk channel, replace the "001" with the applicable X-talk address.

3.1 - Interface push buttons

Up to 4 push buttons can be connected onto the XT-B4N6. When one of the connected push buttons is pushed or released, an API command is triggered. This API message has the following format:

X001A[*X*]   X= *indicates button push or release*

	button 1	button 2	button 3	button 4
X=0	Release	Release	Release	Release
X=3	Push	-	-	-
X=5	-	Push	-	-
X=9	-	-	Push	-
X=17	-	-	-	Push
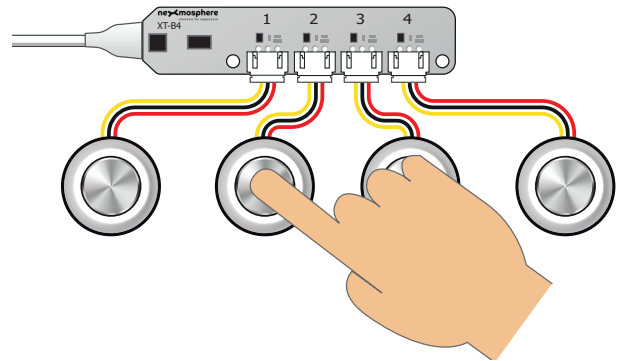
When implementing push button triggers, consider the following:

- The command for a button release is the same for all push buttons: X001A[0]. This command indicates that the push button which was pushed last has been released.
- When multiple push buttons on the same XT-B4N6 are pressed simultaneously, a unique command for that combination is generated. For the complete list of all combinations, please see the final pages of this document (Appendix A).

Example commands

Push button 1 is pushed
X001A[3]

Push button 2 is pushed
X001A[5]

Push button 3 is pushed
X001A[9]

Push button 4 is pushed
X001A[17]

Push button which was pushed last is released
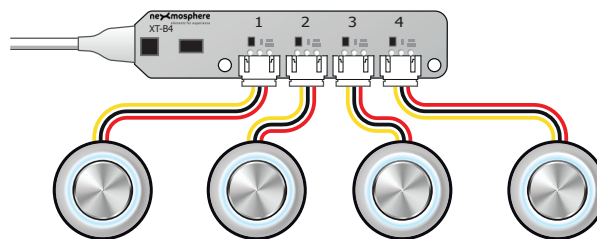X001A[0]

3.2 - Button LED control

The XT Push Button interface comes with the ability to control the LED rings of connected push buttons. Nexmosphere offers several push button options with controllable LEDs. For more information on these buttons, see the Accessories section on page 5.

The XT Push Button interface can set these button LEDs to 4 different states: on, off, slow blink and fast blink. Through an API command, the LED of each button can be set to a different state. However, this command indicates and sets the state for all LEDs simultaneously. This API command has the following format:

`X001A[X]`   X= indicates LED output

There is a total of 256 combinations of LED outputs available. Below, a subset of these options is listed. For the complete list of options, please see the final pages of this document (Appendix B).

Example commands

Set all LEDs on

`X001A[255]`

Set all LEDs to fast blink

`X001A[85]`

Set LED 2 to fast blink, others off

`X001A[4]`

Set LED 4 to off, others on

`X001A[64]`

	LED 1	LED 2	LED 3	LED 4
Set all LEDs to same state				
X=0	off	off	off	off
X=85	fast blink	fast blink	fast blink	fast blink
X=170	slow blink	slow blink	slow blink	slow blink
X=255	on	on	on	on
Set one LED on, others off				
X=3	on	off	off	off
X=12	off	on	off	off
X=48	off	off	on	off
X=192	off	off	off	on
Set one LED off, others on				
X=252	off	on	on	on
X=243	on	off	on	on
X=207	on	on	off	on
X=64	on	on	on	off
Set one LED to fast blink, others OFF				
X=1	fast blink	off	off	off
X=4	off	fast blink	off	off
X=16	off	off	fast blink	off
X=64	off	off	off	fast blink
Set one LED to slow blink, others OFF				
X=2	slow blink	off	off	off
X=8	off	slow blink	off	off
X=32	off	off	slow blink	off
X=128	off	off	off	slow blink

4. Installation requirements and guidelines

When integrating push buttons with the XT Push Button interface into your digital signage installation, several installation requirements and guidelines need to be taken into account in order for the sensor to perform optimal and operate stable.

4.1 - Connection Diagrams

The XT Push button interface can be connected to any X-talk interface and is therefore compatible with all Xperience controllers. Make sure the XT Push Button interface is connected to the X-talk interface before powering the Xperience controller. Otherwise, the XT Push Button interface will not be recognized by the Xperience controller and no sensor output will be provided.
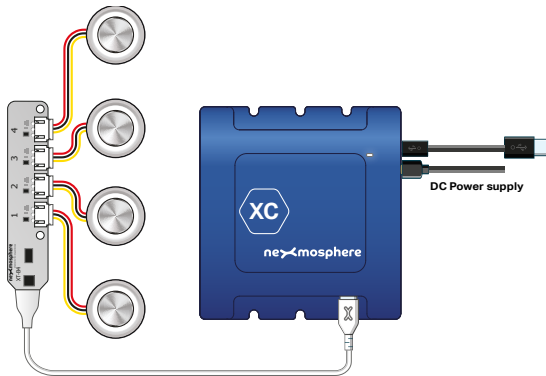
Example connection to XC Controller
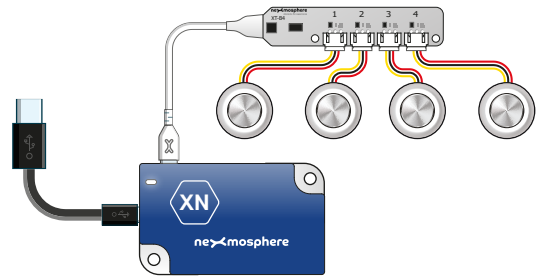
Example connection to XN Controller

4.2 - XT Push Button interface - Accessories

Push buttons

Nexmosphere offers two ranges of push buttons which can be connected to and controlled with the XT-B4N6, the S-B90xxx premium line and the S-B95xxx Valueline buttons. All of these buttons come with a pre-assembled cable and connector, making them a plug&play accessory. The part codes are:

Premium line, 12mm diameter:

S-B20N33/43/63   *no LED, varying cable lengths**

Premium line, 19mm diameter:

S-B90N33/43/63   *no LED, varying cable lengths**
S-B90W13/33/43/63   *white LED, varying cable lengths**
S-B90B33/63   *blue LED, varying cable lengths**
S-B90G33/63   *green LED, varying cable lengths**
S-B90R33/63   *red LED, varying cable lengths**

Valueline, 19mm diameter:

S-B95N33/43/63   *no LED, varying cable lengths**
S-B95W13/33/43/63   *white LED, varying cable lengths**
S-B95B33/43/63   *blue LED, varying cable lengths**
S-B95G33/63   *green LED, varying cable lengths**
S-B95R33/63   *red LED, varying cable lengths**

*Cable lengths:
13 = 15cm cable, 33 = 30cm cable, 43 = 60cm cable, 63 = 180cm cable

Alternatively, for 3rd-party push buttons which don't yet have a cable with JST-PHR-3 connector, Nexmosphere also offers separate button cables which can be attached to the 3rd party push button

Button cables:

CA3-S1C   15cm, stripped end/JST connector
CA3-S3C   30cm, stripped end/JST connector
CA3-S4C   60cm, stripped end/JST connector
CA3-S5C   120cm, stripped end/JST connector
CA3-S6C   180cm, stripped end/JST connector

Mechanical Dimensions S-B20
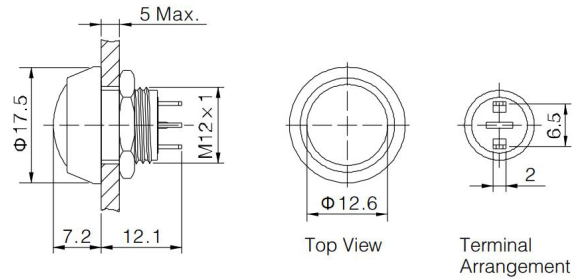
Mechanical Dimensions S-B90

Mechanical Dimensions S-B95

PRODUCT MANUAL | XT PUSH BUTTON INTERFACE
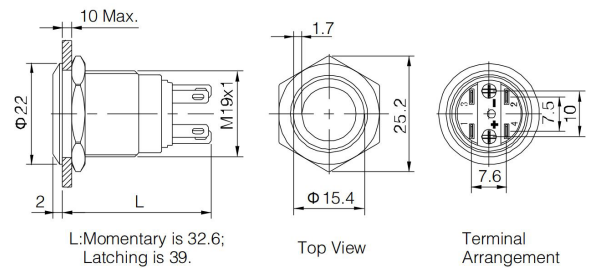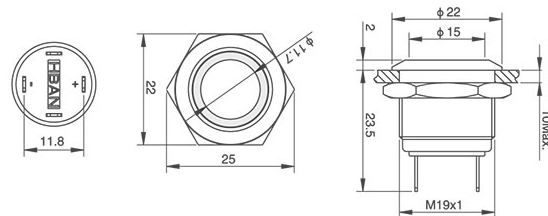
5. Settings

The XT Push Button interface does not have any additional settings that can alter the behaviour of the element. For the API commands regarding the behaviour of the button LEDs, please see section 3.2 on page 3.

6. Quick test

In order to test if the XT Push Button interface is installed correctly, please follow the test procedure below:

Step 1 - Setup

First, connect a push button to either of the four button channels of the XT Push Button interface (e.g. the S-B90W43 on channel 1). Secondly, connect the XT Push Button interface to an Xperience controller and power the Xperience controller.

The status LED of the controller will start to blink and once power-up is completed will be lit continuously. The XT Push Button interface does not have a status LED.

Connect to powered USB port
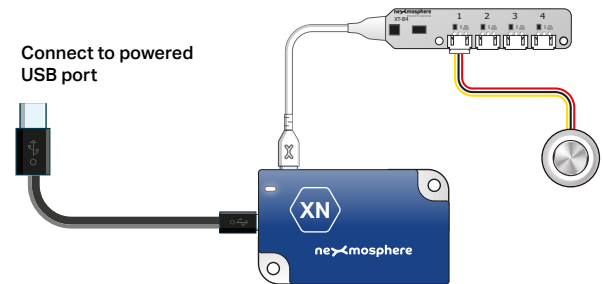
Step 2 - Test

Push the button.

The status LED of the controller should blink.

Connect to powered USB port
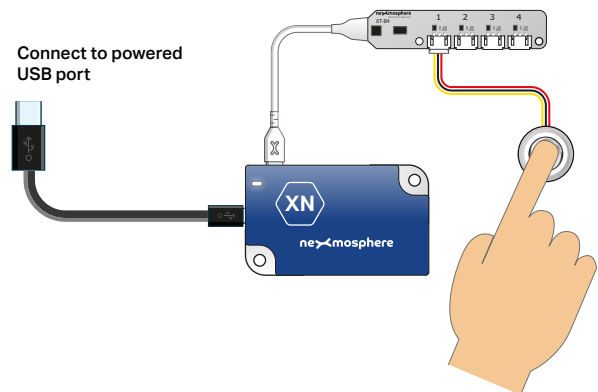
In case any of the steps above does not provide the expected result, please check the installation guidelines in this document.

For a full test we recommend to connect the setup to a mediaplayer or PC and test all API commands listed in this document (see section 3, page 2-3). For more information on how to setup a test for your controller, please see the Quick Start Guide of the Xperience controller you are using. These are available on nexmosphere.com/support-documentation.

Please contact support@nexmosphere.com for any support questions you may have.

		button 1	button 2	button 3	button 4
X001A[	0]	-	-	-	-
X001A[	3]	Push	-	-	-
X001A[	5]	-	Push	-	-
X001A[	7]	Push	Push	-	-
X001A[	9]	-	-	Push	-
X001A[	11]	Push	-	Push	-
X001A[	13]	-	Push	Push	-
X001A[	15]	Push	Push	Push	-
X001A[	17]	-	-	-	Push
X001A[	19]	Push	-	-	Push
X001A[	21]	-	Push	-	Push
X001A[	23]	Push	Push	-	Push
X001A[	25]	-	-	Push	Push
X001A[	27]	Push	-	Push	Push
X001A[	29]	-	Push	Push	Push
X001A[	31]	Push	Push	Push	Push

Appendix A

All available combinations of button input commands

7

		LED 1	LED 2	LED 3	LED 4
X001A[**0**]		off	off	off	off
X001A[**1**]		fast blink	off	off	off
X001A[**2**]		slow blink	off	off	off
X001A[**3**]		on	off	off	off
X001A[**4**]		off	fast blink	off	off
X001A[**5**]		fast blink	fast blink	off	off
X001A[**6**]		slow blink	fast blink	off	off
X001A[**7**]		on	fast blink	off	off
X001A[**8**]		off	slow blink	off	off
X001A[**9**]		fast blink	slow blink	off	off
X001A[**10**]		slow blink	slow blink	off	off
X001A[**11**]		on	slow blink	off	off
X001A[**12**]		off	on	off	off
X001A[**13**]		fast blink	on	off	off
X001A[**14**]		slow blink	on	off	off
X001A[**15**]		on	on	off	off
X001A[**16**]		off	off	fast blink	off
X001A[**17**]		fast blink	off	fast blink	off
X001A[**18**]		slow blink	off	fast blink	off
X001A[**19**]		on	off	fast blink	off
X001A[**20**]		off	fast blink	fast blink	off
X001A[**21**]		fast blink	fast blink	fast blink	off
X001A[**22**]		slow blink	fast blink	fast blink	off
X001A[**23**]		on	fast blink	fast blink	off
X001A[**24**]		off	slow blink	fast blink	off
X001A[**25**]		fast blink	slow blink	fast blink	off
X001A[**26**]		slow blink	slow blink	fast blink	off
X001A[**27**]		on	slow blink	fast blink	off
X001A[**28**]		off	on	fast blink	off
X001A[**29**]		fast blink	on	fast blink	off
X001A[**30**]		slow blink	on	fast blink	off
X001A[**31**]		on	on	fast blink	off
X001A[**32**]		off	off	slow blink	off
X001A[**33**]		fast blink	off	slow blink	off
X001A[**34**]		slow blink	off	slow blink	off
X001A[**35**]		on	off	slow blink	off
X001A[**36**]		off	fast blink	slow blink	off
X001A[**37**]		fast blink	fast blink	slow blink	off
X001A[**38**]		slow blink	fast blink	slow blink	off
X001A[**39**]		on	fast blink	slow blink	off
X001A[**40**]		off	slow blink	slow blink	off
X001A[**41**]		fast blink	slow blink	slow blink	off
X001A[**42**]		slow blink	slow blink	slow blink	off
X001A[**43**]		on	slow blink	slow blink	off
X001A[**44**]		off	on	slow blink	off

Appendix B

All available combinations of button
LED control commands

		LED 1	LED 2	LED 3	LED 4
X001A[**45**]		fast blink	on	slow blink	off
X001A[**46**]		slow blink	on	slow blink	off
X001A[**47**]		on	on	slow blink	off
X001A[**48**]		off	off	on	off
X001A[**49**]		fast blink	off	on	off
X001A[**50**]		slow blink	off	on	off
X001A[**51**]		on	off	on	off
X001A[**52**]		off	fast blink	on	off
X001A[**53**]		fast blink	fast blink	on	off
X001A[**54**]		slow blink	fast blink	on	off
X001A[**55**]		on	fast blink	on	off
X001A[**56**]		off	slow blink	on	off
X001A[**57**]		fast blink	slow blink	on	off
X001A[**58**]		slow blink	slow blink	on	off
X001A[**59**]		on	slow blink	on	off
X001A[**60**]		off	on	on	off
X001A[**61**]		fast blink	on	on	off
X001A[**62**]		slow blink	on	on	off
X001A[**63**]		on	on	on	off
X001A[**64**]		off	off	off	fast blink
X001A[**65**]		fast blink	off	off	fast blink
X001A[**66**]		slow blink	off	off	fast blink
X001A[**67**]		on	off	off	fast blink
X001A[**68**]		off	fast blink	off	fast blink
X001A[**69**]		fast blink	fast blink	off	fast blink
X001A[**70**]		slow blink	fast blink	off	fast blink
X001A[**71**]		on	fast blink	off	fast blink
X001A[**72**]		off	slow blink	off	fast blink
X001A[**73**]		fast blink	slow blink	off	fast blink
X001A[**74**]		slow blink	slow blink	off	fast blink
X001A[**75**]		on	slow blink	off	fast blink
X001A[**76**]		off	on	off	fast blink
X001A[**77**]		fast blink	on	off	fast blink
X001A[**78**]		slow blink	on	off	fast blink
X001A[**79**]		on	on	off	fast blink
X001A[**80**]		off	off	fast blink	fast blink
X001A[**81**]		fast blink	off	fast blink	fast blink
X001A[**82**]		slow blink	off	fast blink	fast blink
X001A[**83**]		on	off	fast blink	fast blink
X001A[**84**]		off	fast blink	fast blink	fast blink
X001A[**85**]		fast blink	fast blink	fast blink	fast blink
X001A[**86**]		slow blink	fast blink	fast blink	fast blink
X001A[**87**]		on	fast blink	fast blink	fast blink
X001A[**88**]		off	slow blink	fast blink	fast blink
X001A[**89**]		fast blink	slow blink	fast blink	fast blink

		LED 1	LED 2	LED 3	LED 4
X001A[90]		slow blink	slow blink	fast blink	fast blink
X001A[91]		on	slow blink	fast blink	fast blink
X001A[92]		off	on	fast blink	fast blink
X001A[93]		fast blink	on	fast blink	fast blink
X001A[94]		slow blink	on	fast blink	fast blink
X001A[95]		on	on	fast blink	fast blink
X001A[96]		off	off	slow blink	fast blink
X001A[97]		fast blink	off	slow blink	fast blink
X001A[98]		slow blink	off	slow blink	fast blink
X001A[99]		on	off	slow blink	fast blink
X001A[100]		off	fast blink	slow blink	fast blink
X001A[101]		fast blink	fast blink	slow blink	fast blink
X001A[102]		slow blink	fast blink	slow blink	fast blink
X001A[103]		on	fast blink	slow blink	fast blink
X001A[104]		off	slow blink	slow blink	fast blink
X001A[105]		fast blink	slow blink	slow blink	fast blink
X001A[106]		slow blink	slow blink	slow blink	fast blink
X001A[107]		on	slow blink	slow blink	fast blink
X001A[108]		off	on	slow blink	fast blink
X001A[109]		fast blink	on	slow blink	fast blink
X001A[110]		slow blink	on	slow blink	fast blink
X001A[111]		on	on	slow blink	fast blink
X001A[112]		off	off	on	fast blink
X001A[113]		fast blink	off	on	fast blink
X001A[114]		slow blink	off	on	fast blink
X001A[115]		on	off	on	fast blink
X001A[116]		off	fast blink	on	fast blink
X001A[117]		fast blink	fast blink	on	fast blink
X001A[118]		slow blink	fast blink	on	fast blink
X001A[119]		on	fast blink	on	fast blink
X001A[120]		off	slow blink	on	fast blink
X001A[121]		fast blink	slow blink	on	fast blink
X001A[122]		slow blink	slow blink	on	fast blink
X001A[123]		on	slow blink	on	fast blink
X001A[124]		off	on	on	fast blink
X001A[125]		fast blink	on	on	fast blink
X001A[126]		slow blink	on	on	fast blink
X001A[127]		on	on	on	fast blink
X001A[128]		off	off	off	slow blink
X001A[129]		fast blink	off	off	slow blink
X001A[130]		slow blink	off	off	slow blink
X001A[131]		on	off	off	slow blink
X001A[132]		off	fast blink	off	slow blink
X001A[133]		fast blink	fast blink	off	slow blink
X001A[134]		slow blink	fast blink	off	slow blink

		LED 1	LED 2	LED 3	LED 4
X001A[**135**]		on	fast blink	off	slow blink
X001A[**136**]		off	slow blink	off	slow blink
X001A[**137**]		fast blink	slow blink	off	slow blink
X001A[**138**]		slow blink	slow blink	off	slow blink
X001A[**139**]		on	slow blink	off	slow blink
X001A[**140**]		off	on	off	slow blink
X001A[**141**]		fast blink	on	off	slow blink
X001A[**142**]		slow blink	on	off	slow blink
X001A[**143**]		on	on	off	slow blink
X001A[**144**]		off	off	fast blink	slow blink
X001A[**145**]		fast blink	off	fast blink	slow blink
X001A[**146**]		slow blink	off	fast blink	slow blink
X001A[**147**]		on	off	fast blink	slow blink
X001A[**148**]		off	fast blink	fast blink	slow blink
X001A[**149**]		fast blink	fast blink	fast blink	slow blink
X001A[**150**]		slow blink	fast blink	fast blink	slow blink
X001A[**151**]		on	fast blink	fast blink	slow blink
X001A[**152**]		off	slow blink	fast blink	slow blink
X001A[**153**]		fast blink	slow blink	fast blink	slow blink
X001A[**154**]		slow blink	slow blink	fast blink	slow blink
X001A[**155**]		on	slow blink	fast blink	slow blink
X001A[**156**]		off	on	fast blink	slow blink
X001A[**157**]		fast blink	on	fast blink	slow blink
X001A[**158**]		slow blink	on	fast blink	slow blink
X001A[**159**]		on	on	fast blink	slow blink
X001A[**160**]		off	off	slow blink	slow blink
X001A[**161**]		fast blink	off	slow blink	slow blink
X001A[**162**]		slow blink	off	slow blink	slow blink
X001A[**163**]		on	off	slow blink	slow blink
X001A[**164**]		off	fast blink	slow blink	slow blink
X001A[**165**]		fast blink	fast blink	slow blink	slow blink
X001A[**166**]		slow blink	fast blink	slow blink	slow blink
X001A[**167**]		on	fast blink	slow blink	slow blink
X001A[**168**]		off	slow blink	slow blink	slow blink
X001A[**169**]		fast blink	slow blink	slow blink	slow blink
X001A[**170**]		slow blink	slow blink	slow blink	slow blink
X001A[**171**]		on	slow blink	slow blink	slow blink
X001A[**172**]		off	on	slow blink	slow blink
X001A[**173**]		fast blink	on	slow blink	slow blink
X001A[**174**]		slow blink	on	slow blink	slow blink
X001A[**175**]		on	on	slow blink	slow blink
X001A[**176**]		off	off	on	slow blink
X001A[**177**]		fast blink	off	on	slow blink
X001A[**178**]		slow blink	off	on	slow blink
X001A[**179**]		on	off	on	slow blink

		LED 1	LED 2	LED 3	LED 4
X001A[**180**]		off	fast blink	on	slow blink
X001A[**181**]		fast blink	fast blink	on	slow blink
X001A[**182**]		slow blink	fast blink	on	slow blink
X001A[**183**]		on	fast blink	on	slow blink
X001A[**184**]		off	slow blink	on	slow blink
X001A[**185**]		fast blink	slow blink	on	slow blink
X001A[**186**]		slow blink	slow blink	on	slow blink
X001A[**187**]		on	slow blink	on	slow blink
X001A[**188**]		off	on	on	slow blink
X001A[**189**]		fast blink	on	on	slow blink
X001A[**190**]		slow blink	on	on	slow blink
X001A[**191**]		on	on	on	slow blink
X001A[**192**]		off	off	off	on
X001A[**193**]		fast blink	off	off	on
X001A[**194**]		slow blink	off	off	on
X001A[**195**]		on	off	off	on
X001A[**196**]		off	fast blink	off	on
X001A[**197**]		fast blink	fast blink	off	on
X001A[**198**]		slow blink	fast blink	off	on
X001A[**199**]		on	fast blink	off	on
X001A[**200**]		off	slow blink	off	on
X001A[**201**]		fast blink	slow blink	off	on
X001A[**202**]		slow blink	slow blink	off	on
X001A[**203**]		on	slow blink	off	on
X001A[**204**]		off	on	off	on
X001A[**205**]		fast blink	on	off	on
X001A[**206**]		slow blink	on	off	on
X001A[**207**]		on	on	off	on
X001A[**208**]		off	off	fast blink	on
X001A[**209**]		fast blink	off	fast blink	on
X001A[**210**]		slow blink	off	fast blink	on
X001A[**211**]		on	off	fast blink	on
X001A[**212**]		off	fast blink	fast blink	on
X001A[**213**]		fast blink	fast blink	fast blink	on
X001A[**214**]		slow blink	fast blink	fast blink	on
X001A[**215**]		on	fast blink	fast blink	on
X001A[**216**]		off	slow blink	fast blink	on
X001A[**217**]		fast blink	slow blink	fast blink	on
X001A[**218**]		slow blink	slow blink	fast blink	on
X001A[**219**]		on	slow blink	fast blink	on
X001A[**220**]		off	on	fast blink	on
X001A[**221**]		fast blink	on	fast blink	on
X001A[**222**]		slow blink	on	fast blink	on
X001A[**223**]		on	on	fast blink	on
X001A[**224**]		off	off	slow blink	on

		LED 1	LED 2	LED 3	LED 4
X001A[**225**]		fast blink	off	slow blink	on
X001A[**226**]		slow blink	off	slow blink	on
X001A[**227**]		on	off	slow blink	on
X001A[**228**]		off	fast blink	slow blink	on
X001A[**229**]		fast blink	fast blink	slow blink	on
X001A[**230**]		slow blink	fast blink	slow blink	on
X001A[**231**]		on	fast blink	slow blink	on
X001A[**232**]		off	slow blink	slow blink	on
X001A[**233**]		fast blink	slow blink	slow blink	on
X001A[**234**]		slow blink	slow blink	slow blink	on
X001A[**235**]		on	slow blink	slow blink	on
X001A[**236**]		off	on	slow blink	on
X001A[**237**]		fast blink	on	slow blink	on
X001A[**238**]		slow blink	on	slow blink	on
X001A[**239**]		on	on	slow blink	on
X001A[**240**]		off	off	on	on
X001A[**241**]		fast blink	off	on	on
X001A[**242**]		slow blink	off	on	on
X001A[**243**]		on	off	on	on
X001A[**244**]		off	fast blink	on	on
X001A[**245**]		fast blink	fast blink	on	on
X001A[**246**]		slow blink	fast blink	on	on
X001A[**247**]		on	fast blink	on	on
X001A[**248**]		off	slow blink	on	on
X001A[**249**]		fast blink	slow blink	on	on
X001A[**250**]		slow blink	slow blink	on	on
X001A[**251**]		on	slow blink	on	on
X001A[**252**]		off	on	on	on
X001A[**253**]		fast blink	on	on	on
X001A[**254**]		slow blink	on	on	on
X001A[**255**]		on	on	on	on