

BEHRINGER - B-CONTROL Nano - BCN44

System Exclusive Messages

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The BCN44 can send two types of message, patch dump and bank dump.



To send the current patch from the BCN44:

- Press [EDIT/EXIT] + [STORE], display shows GLOb
- Turn Encoder 3 to left, display shows SnGL
- Push Encoder 3, displays shows dUMP during 1 second then the BNC44 sends a single sysex message of 236 bytes.



To send all patches (the bank) from the BCN44:

(be patient, the process takes two or three minutes!)

- Press [EDIT/EXIT] + [STORE], display shows GLOb
- Turn Encoder 3 to right, display shows ALL
- Push Encoder 3, displays shows dUMP during 1 second then the BNC44 sends 1188(!) sysex message of 29 bytes.

Single patch message

A single patch message contains 236 bytes and contains:

- 1 sysex header of 7 bytes
- 4 encoder info blocs of 19 bytes for encoders 1 to 4
- 8 switch info blocs of 19 bytes for switches 1 to 4 then encoder switches 1 to 4
- 1 sysex footer of 1 byte

Sysex Header :

offset : value - description

00 : hF0 - 'start of exclusive' command ('SOX')

01 : h00 - Manufacturer ID. (When equals zero, ID is made of the two following bytes.)

02 : h20 -

03 : h32 - 2032 = Behringer ID

04 : h00 - Device ID : {h00...h0F} as set on the BCN44 (displayed as 1 to 16)

05 : h17 - BCN44 ID

06 : h20 - Message command 'single patch dump'

Sysex Footer :

offset : value - description

00 : hF7 - 'end of exclusive' command ('EOX')

Encoder info bloc :

Content depends on value of first byte (at offset 0).
Value ranges from 0 to 6 for { Off, PC, CC, NRPN, PB, AT, GS }.

Program Change :

00 : TY - h01

01 : CH – Channel { h00...h0F } = { 1...16 }

02 : BM – Bank select MSB { h00...h7F }

03 :

04 : BL – Bank select LSB { h00...h7F }

05 :

06 :

07 :

08 :

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag – bit 1 :
bit 2 : h00 = Bank select LSB on, h02 = Bank select LSB off
bit 3
bit 4 : h00 = Bank select MSB on, h08 = Bank select MSB off
bit 5 :
bit 6
bit 7 : always h40 (means encoder ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 :

18 :

Control Change :

00 : TY - 02

01 : CH - Channel { h00...h0F } = { 1...16 }

02 : CT - Controller number { h00...h7F }

03 :

04 : LO - Minimum value bits 1 to 7 { h00...h7F }

05 : L2 - Minimum value bits 9 to 14 { h00...h3F } (in 14 bit modes)

06 : HI - Maximum value bits 1 to 7 { h00...h7F }

07 : H2 - Maximum value bits 9 to 14 { h00...h3F } (in 14 bit modes)

08 : MD - Mode { h00...h07 } = { absolute, rel1, rel2, rel3, abs 14, rel1 14, rel2 14, rel3 14 }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 : Maximum value bit 8 (in 14 bit modes)
bit 2 : h00 = use minimum value, h02 = dont use minium value (set to zero)
bit 3 : Minimum value bit 8 (in 14 bits modes)
bit 4 :
bit 5 :
bit 6 :
bit 7 : always h40 (means encoder ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use maximum value, h40 = dont use maximum value (set to zero)

18 :

Non Registered Parameter Number :

00 : TY - 03

01 : CH - Channel { h00...h0F } = { 1...16 }

02 : NN - NRPN number bits 1 to 7 { h00...h7F }

03 : N2 - NRPN number bits 9 to 14 { h00...h3F }

04 : LO - Minimum value bits 1 to 7 { h00...h7F }

05 : L2 - Minimum value bits 9 to 14 { h00...h3F } (in 14 bit modes)

06 : HI - Maximum value bits 1 to 7 { h00...h7F }

07 : H2 - Maximum value bits 9 to 14 { h00...h3F } (in 14 bit modes)

08*: MD - Mode {h00...h08}={abs, rel1, rel2, rel3, incdec, abs 14, rel1 14, rel2 14, rel3 14}

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 : Maximum value bit 8 (in 14 bit modes)
bit 2 : h00 = use minimum value, h02 = dont use minium value (set to zero)
bit 3 : Minimum value bit 8 (in 14 bits modes)
bit 4 :
bit 5 : NRPN number bit 8
bit 6 :
bit 7 : always h40 (means encoder ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use maximum value, h40 = dont use maximum value (set to zero)

18 :

(*) Careful, list is different than for CC : value for 'inc dec' is inserted in the middle.

Pitch Bend :

00 : TY - 04

01 : CH - Channel { h00...h0F } = { 1...16 }

02 :

03 :

04 : RA - Range { h00...h7F }

05 :

06 :

07 :

08 :

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 : h00 = use range, h02 = dont use range (set to zero)
bit 3 :
bit 4 :
bit 5 :
bit 6 :
bit 7 : always h40 (means encoder ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 :

18 :

After touch :

00 : TY - 05

01 : CH - Channel { h00...h0F } = { 1...16 }

02 : KE - Key number { h00...h0F } = { 0...127 }

03 :

04 : LO - Minimum value { h00...h7F }

05 :

06 : HI - Maximum value { h00...h7F }

07 :

08 :

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 : h00 = use minimum, h02 = dont use minimum (set to zero)
bit 3 :
bit 4 : h00 = Use Key Number, h08 = All keys (monophonic aftertouch)
bit 5 :
bit 6 :
bit 7 : always h40 (means encoder ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use maximum value, h40 = dont use maximum value (set to zero)

18 :

GS/XG :

00 : TY - 05

01 : CH - Channel { h00...h0F } = { 1...16 }

02 : GS - {h00..h0E}={Cutoff,Reso,Rate,Depth... (see user manual table page 14) }

03 :

04 : LO - Minimum value { h00...h7F }

05 :

06 : HI - Maximum value { h00...h7F }

07 :

08 :

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 : h00 = use minimum, h02 = dont use minimum (set to zero)
bit 3 :
bit 4 :
bit 5 :
bit 6 :
bit 7 : always h40 (means encoder ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use maximum value, h40 = dont use maximum value (set to zero)

18 :

Switch info bloc :

Content depends on value of first byte (at offset 0).

Value ranges from 0 to 6 for { Off, PC, CC, NRPN, Note, AT, MMC, GS }.

PC (Program Change) :

00 : TY - h01

01 : CH – Channel { h00...h0F } = { 1...16 }

02 : BM – Bank select MSB { h00...h7F }

03 :

04 : BL – Bank select LSB { h00...h7F }

05 :

06 : PN – Program number { h00...h7F }

07 :

08 :

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag – bit 1 :
bit 2 : h00 = Bank select LSB on, h02 = Bank select LSB off
bit 3
bit 4 : h00 = Bank select MSB on, h08 = Bank select MSB off
bit 5 :
bit 6
bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = Program number on, h40 = program number off

18 :

Control Change :

00 : TY - 02

01 : CH – Channel { h00...h0F } = { 1...16 }

02 : CT – Controller number { h00...h7F }

03 :

04 : ON – On value / increment { h00...h7F }

05 :

06 : OF – Off value { h00...h7F }

07 :

08 : MD – Mode { h00...h03 } = { toggle off, toggle on, increment +, increment - }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 :
bit 6 :
bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use off value, h40 = dont use off value

18 : flag - bit 1 : ? (set on encoder switches for patches no. 3 up ...)
bit 2 : ?
bit 3 :
bit 4 :
bit 5 :
bit 6 :
bit 7 :

Non Registered Parameter Number :

00 : TY - 03

01 : CH – Channel { h00...h0F } = { 1...16 }

02 : NN – NRPN number bits 1 to 7 { h00...h7F }

03 : N2 – NRPN number bits 8 to 14 { h00...h3F }

04 : ON – On value / Increment { h00...h7F }

05 :

06 : OF – Off value { h00...h7F }

07 :

08 : MD – Mode {h00...h03}={ toggle off, toggle on, increment +, increment - }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : NRPN number bit 8
bit 6 :
bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 :

18 :

Play note :

00 : TY - 04

01 : CH – Channel { h00...h0F } = { 1...16 }

02 : KE – Note number (key) { h00...h3C...h7F } = { C-2...C3...G+8 }

03 :

04 : VE – Note on velocity* { h00...h7F }

05 :

06 :

07 :

08 : MD – Mode {h00...h01}={ toggle off, toggle on }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
 bit 2 :
 bit 3 :
 bit 4 :
 bit 5 :
 bit 6 :
 bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
 bit 2 :
 bit 3 :
 bit 4 :
 bit 5 : h00 = Value indication on, h10 = value indication off
 bit 6 :
 bit 7 :

18 :

(*) Remark: Note off sent by the BCN does not use Midi 'Note Off' message (h8X KE VE) but uses Midi 'Note On' message with a velocity of zero (h9X KE 00), wich is accepted by the MIDI standard.

The drawback of this is that it cannot use the Note Off velocity parameter used by some rare synths (like Alesis Ion/Micron).

After touch :

00 : TY - 05

01 : CH - Channel { h00...h0F } = { 1...16 }

02 : KE - Key number { h00...h0F } = { 0...127 }

03 :

04 : ON - On value { h00...h7F }

05 :

06 : OF - Off value { h00...h7F }

07 :

08 : MD - Mode {h00...h03}={ toggle off, toggle on, increment +, increment - }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 : h00 = Use Key Number, h08 = All keys (monophonic aftertouch)
bit 5 :
bit 6 :
bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use off value, h40 = dont use off value (set to zero)

18 :

Midi Machine Control :

00 : TY - 06

01 : CH – Channel { h00...h0F } = { 1...16 }

02 : CM – Command {h00..h07}={ play, pause, stop, fwd, rew, locate, punch in, punch out}

03 :

04 : HM – Hour:Minute locator

05 :

06 : SF – Second:Frame locator

07 :

08 : FR – Frame Rate { h00...h04 } = { off, 24, 25, 30d, 30 }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 : h00 = use locator, h08 dont use locator (strange behavior ?)
bit 5 :
bit 6 :
bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 :

18 :

GS/XG :

00 : TY - 05

01 : CH - Channel { h00...h0F } = { 1...16 }

02 : GS - {h00..h0E}={Cutoff,Reso,Rate,Depth... (see user manual table page 14) }

03 :

04 : ON - On value { h00...h7F }

05 :

06 : OF - Off value { h00...h7F }

07 :

08 : MD - Mode {h00...h01}={ toggle off, toggle on }

09 :

10 :

11 :

12 :

13 :

14 :

15 :

16 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 :
bit 6 :
bit 7 : always h00 (means switch ?)

17 : flag - bit 1 :
bit 2 :
bit 3 :
bit 4 :
bit 5 : h00 = Value indication on, h10 = value indication off
bit 6 :
bit 7 : h00 = use off value, h40 = dont use off value (set to zero)

18 :

Multiple patches message

A multiple patches message is made of 1188 item messages, one for each patch (99) and each encoder/switch (12).

An item message contains 29 bytes and contains:

- 1 sysex header of 7 bytes
- 1 item definition of 21 bytes
- 1 sysex footer of 1 byte

The BCN does not seem to accept a single item message... Upon receiving the sysex, the display blinks (the decimal dot) and the led of the store button blinks also. But the newly sent value is not kept.

Sysex Header :

offset : value - description

00 : hF0 - 'start of exclusive' command ('SOX')

01 : h00 - Manufacturer ID. (When equals zero, ID is made of the two following bytes.)

02 : h20 -

03 : h32 - 2032 = Behringer ID

04 : h00 - Device ID : {h00...h0F} as set on the BCN44 (displayed as 1 to 16)

05 : h17 - BCN44 ID

06 : h50 - Message command 'item dump'

Sysex Footer :

offset : value - description

00 : hF7 - 'end of exclusive' command ('EOX')

Item definition bloc :

Definition is identical to Encoder bloc or Switch bloc except that:

- value at offset 16,17 are moved to offset 18,19
 - value at offset 20 has bit 3 and 4 set
 - values at offset 16, 17 & 20 are used to qualify the adress of the item :
 - 16 : bits 9 to 15 of address { h00...h4A }
 - 17 : bits 1 to 7 of address { h00, h10,...h70 }
 - 20 : bit 1 : bit 8 of address { h00, h01 }
- Minium address is h0000 (encoder #1 of patch no.1)
Maximum address ish4A30 (encoder #4 switch of patch no.99)

Computing address from patch number :

Encoder 3 of patch 71 is at address : $(70 * 12 + 2) * 16 = h34A0$

Value[16] = $h34A0 / 256 = h34$

Value[17] = $h3440 \& 127 = h20$

Value[18].bit1 = $(h34A0 / 128) \& 1 = 1$

Computing item from address :

with Value[16] = h17, Value[17] = h30, Value[20].bit1 = 1

Address = h17B0

Patch number = $((h17B0 / 16) \text{ div } 12) + 1 = 31 + 1 = \text{no.32}$

Item = 7 (encoders are 0...3, switches 4...7, encoder switches 8...11) = switch #4 (learn)