

## Parameter HX3-Firmware Version #3.21 and up

Kommunikation mit serieller TTL-Schnittstelle PL3 (bzw. PL2 bei HOAX1) - für RS-232 Pegelwandler oder USB-Adapter FTDI TTL-232R-5V verwenden!  
Schnittstellen-Parameter: 57600 Bd, 8n1. Backspace (#8) löscht letztes Zeichen aus dem Befehlszeilenpuffer, andere Control-Zeichen werden ignoriert.  
HOAX liefert kein Echo, bei einem Terminal-Programm deshalb ggf. lokales Echo einstellen. Nur ein Befehl pro Zeile. Befehle werden erst nach dem Empfang von CR oder CR/LF verarbeitet.  
Lässt man bei Ausgabe-Befehlen das "!" weg, erfolgt keine Ausgabe des "#0:255=0 [OK]" Prompts (vermindert Datenmenge bei kritischen Anwendungen)  
**Werte werden nur dauerhaft (im EEPROM) gespeichert, wenn dem Befehl unmittelbar eine Schreibfreigabe mit WEN=1 vorangeht!**

### HX3 Communication Protocol

Plain Text, use terminal emulator like TeraTerm 4.7x (recommended)

Serial communication (PL26) at 57600 Bd, 8n1 - use USB adaptor cable FTDI TTL-232R 5V

Each command/request may be given by SubCh or Mnemonic plus offset (if available).

Examples separated by comma. Each command/request must be terminated by <CR> (ASCII 13).

Values will be stored in non-volatile EEPROM if preceded by WEN=1 command

### Parameter Query:

xxx?

with xxx = Parameter Number (SubCh). "?" is optional

### Response:

#0:xxx=yyy

with xxx = Parameter Number (SubCh), yyy = Value

### Setting a Parameter:

xxx=yyy!

with xxx = Parameter Number (SubCh), yyy = New Value (as in Range). "!" is optional

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## General/Ident

Mnem.	Argument	SubCh	Range	Example	Example Resonse	Factory Default	Remarks
IDN	--	254		IDN?	#0:255=1.74 [HOAX ...]		Identify, Serial Number
STR**	--	255		STR?, 255?	#0:255=0 [OK]		Status Request
ERC	--	251	Integer	ERC?	#0:251=0		Error Counter Read
WEN	--	250	0..1	WEN=1!, 0:250=1!, WEN=1, 250=1	#0:255=16 [OK]		<b>EEPROM Write Enable, store next param permanently to EEPROM (non-volatile)</b>
RST	--	9999		RST, 9999?	(Reboot)		System Reset, reboot
	--	9998	--	9998?			Reload all params

Mnem.	Argument	SubCh	Range	Example	Example Resonse	Remarks
VAL**	0..3**	0..3	LongInt	VAL 0?, 0:7?	#0:2=0	FPGA Register direct access from HOAX-Core, raw values, for debug use. VAL 3 yields FPGA date code like [\$24012011]
VAL*	4..249*	0..127	LongInt	16?	#0:16=255	FPGA Register direct access to HOAX-Core, raw values (may be overwritten by firmware) - see note at bottom
VAL**	2**	2	LongInt			Last MIDI command received from FIFO, 3 Bytes CMD, DB1, DB2

## Parameter Table Organ (active)

	400..408	0..127				<b>9 upper drawbars 16-1</b>
	409	0..5	409?, 409=3		#0:409=3	Vibrato knob position 0 to 5 (V1, C1, V2, C2, V3, C3)
	410	0..1				upper row tab setting (4 bits percussion, vib on upper)
	411	0..2				Parameter Table Percussion SelectTab, Wert 0=OFF, 1=2nd, 2=3rd
	412	0..1				Parameter Table Percussion LengthTab, Wert 0=Short, 1=Long
	413	0..1				Parameter Table Percussion VolumeTab, Wert 0=Soft, 1=Normal
	416..424	0..127				<b>Parameter Table Lower Drawbars</b>
	425..426	0..127				Parameter Table Bass, Argument/SubCh: 0=Bass 16', 1=Bass 5 1/3', 2=Bass 8'
	428	0..127				Parameter Table Bass Sustain
	429	0..1				Parameter Table Vibrato On Lower, Wert 0=OFF, 1=ON
	430					Parameter Table Split ON

## Preset/Program Change

Mnem.	Argument	SubCh	Range	Example	Example Resonse	Remarks
		350	0..15	350=4		Program/Preset Change Upper
		351	0..15			Program/Preset Change Upper
		352	0..3	352=3!		EFX Change (Reverb Level)

## Parameter Table Organ (Defaults)

Mnem.	Argument	SubCh	Range	Example	Example Resonse	Default	Remarks
		500**	0..15			0	<b>Transpose 6 semitones</b>
		501**	0..15			24	Default Splitpoint
		502	Byte	502=14		29	Vib1 amplitude modulation depth
		503	Byte			55	Vib2 amplitude modulation depth
		504	Byte			95	Vib3 amplitude modulation depth
		505	Byte	505=17		70	Vib1 phase/frequ modulation depth
		506	Byte			120	Vib2 phase/frequ modulation depth
		507	Byte			180	Vib3 phase/frequ modulation depth
		508	Byte			167	ChorusDryMix
		509	Byte			154	ChorusVibMix (wet)
		510	Byte			2	MIDI routing options (see Encodings table)
		511	0..25			0	<b>MIDI cannel 0..15 (i.e. channel 1..16)</b>
		512	0..63			180	PercNormalLevel
		513	0..64			88	PercSoftLevel
		514	Byte			11	PercLongTimer
		515	Byte			35	PercShrtTimer
		516	0..15	516=7		7	Flutter
		517	0..3			2	Leakage (0 minimal, 3 maximal)
		518	0..1			0	Vintage ("old caps")
		519	0..31	519=6			Scan Core Select, 0 = Chained OrganScan61, 1 = MIDI receive, 2 = FatarScan2, 3 = OrganScan16/Bass parallel 44 keys, 4 = OrganScan16/Bass parallel 49 keys, 5 = OrganScan16/Bass parallel 61 keys, 6 = Test routine, 7 = OptoScan by Gerrit or XB2 Core. Needs Reset/Reload by 9998 or 9999 to engage.
		520	Byte			0	<b>Default Split Option 0=no change, 1=Lower To Upper, 2=Bass To Upper, 3=Bass To Lower - from ScanCores #0B and up</b>
		521	Boolean			0	Analog Input Ports Disable (despite swell)
		522	Boolean	522=255		255	<b>Swell Pot Enable</b>
		523	Byte			200	Swell value if pot disabled
		524	Boolean	524=0		0	<b>Tone Pot Enable</b>
		525	0..127			30	<b>Tone Pot value if TonePot disabled</b>
		526	0..127			90	AO28 Preamp Lowpass 125 Hz Equalizer Bass
		527	Boolean			255	<b>Disable 1' on Percussion</b>
		528	Boolean	528=255		0	<b>Disable 16' Foldback on lowest octave</b>
		529	0..50	529=105		105	<b>KeyClick, computed from Contact Spring Flex (0..15, default 9) added to 16x Contact Spring Damping (0..15, default 6), 105=\$69</b>
		530	0..3			0	Default reverb program
		531	Byte	531=1		0	<b>MIDI CC set: 0=NI B4, 1=Voce, 2=Hamichord, 3=Hammond</b>

## Parameter Table Leslie (Defaults)

Mnem.	Argument	SubCh	Range	Example	Default	Remarks
		600..631	Byte	602=75		Parameter table Leslie level, FM and AM
		602	Byte		129	Horn Phase 1 FM
		603	Byte		60	Horn Phase 2 FM
		604	Byte		124	Horn Phase 3 FM
		605	Byte		47	Horn Phase 2 Level
		606	Byte		147	Horn Phase 3 Level
		607	Byte		101	Horn Phase 1 Level
		608	Byte		170	Horn 2 kHz Highpass Filter AM
		609	Byte		4	AO28 Triode k2 distortion
		611	Byte		25	<b>Initial 147 Amp level (Leslie volume)</b>

618	Byte	135	Rotor Phase 1 FM
619	Byte	120	Rotor Phase 2 FM
620	Byte		not used
621	Byte	113	Rotor Phase 1 Level
622	Byte	93	Rotor Phase 2 Level
623	Byte	85	Rotor Dry Level, bypass non-modulated
624	Byte	55	Rotor AM

640..655	Byte		Parameter Tabelle Leslie Timers/Speeds
642	Byte	16	Horn Speed Slow
643	Byte	14	Rotor Speed Slow
644	Byte	138	Horn Speed Fast
645	Byte	129	Rotor Speed Fast
646	Byte	4	Horn Ramp Up
647	Byte	20	Rotor Ramp Up
648	Byte	3	Horn Ramp Down
649	Byte	25	Rotor Ramp Down
650	Byte	255	<b>Amp 122 Volume Potentiometer Enable</b>
651	Byte	70	<b>Amp 122 Fixed Volume if disabled</b>
652	Byte	0	not used (was Bass on Leslie on pre 3.0 Firmware)
660..691	Integer	0	Parameter table Leslie bandpass bank
660	Integer	0	Horn Filter replaced by FIR, params no longer used
661	Integer	0	
662	Integer	0	
663	Integer	0	
664	Integer	0	
665	Integer	0	
666	Integer	0	
667	Integer	0	
668	Integer	0	
676	Integer	19	Rotor Bandpass 0 frequency
677	Integer	32	Rotor Bandpass 1 damping
678	Integer	130	Rotor Bandpass 1 level
679	Integer	103	Rotor Bandpass 1 frequency
680	Integer	55	Rotor Bandpass 1 damping
681	Integer	18	Rotor Bandpass 1 level
682	Integer	87	Horn Throb (AM) frequency
683	Integer	109	Horn Throb (AM) damping
684	Integer	0	Horn Throb (AM) min. level
685	Integer	200	Crossover frequency
686	Integer	137	Crossover damping
687	Integer	115	Crossover level

### Parameter Table EFX/Reverb (Defaults)

Mnem.	Argument	SubCh	Range	Example	Default	Remarks
		700..715	Byte			<b>Commands preceded by WEN=1 will be non-volatile</b>
		700..703	Byte		0	<b>Parameter table 4 effect programs DSP, 3 analog values 0..255 and FV-1 program number 0..7</b> not used (Reverb OFF)
		704	Byte		86	PWM Pot 0 FV-1 (Reverb 1)
		705	Byte		0	PWM Pot 1 FV-1
		706	Byte		135	<b>PWM Pot 2 FV-1 (Reverb Output Level)</b>
		707	Byte		1	FV-1 Program number
		708	Byte		0	PWM Pot 0 FV-1 (Reverb 2)
		709	Byte		0	PWM Pot 1 FV-1
		710	Byte		172	<b>PWM Pot 2 FV-1 (Reverb Output Level)</b>
		711	Byte		3	FV-1 Program number
		712	Byte		91	PWM Pot 0 FV-1 (Reverb 3)
		713	Byte		31	PWM Pot 1 FV-1
		714	Byte		205	<b>PWM Pot 2 FV-1 (Reverb Output Level)</b>
		715	Byte		3	FV-1 Program number

### Various, Communication

Mnem.	Argument	SubCh	Range	Example	Example Resonse	Remarks
		300..323**	--	300?	#0:723=232	ADC direct read, 24 analog inputs
		324**				direct read PL7
		325**				direct read PL11
		326**				direct read PL5
		327**				direct read PL8
		328**				direct read PL12
		900	Byte			<b>Tab buttons row 1 direct read/write (Percussion, Vib ON, Leslie)</b>
		901	Byte			<b>Tab buttons row 2 direct read/write (Common presets, reverb, split)</b>
		998**		998?		MIDI Lockout Status, 0 = user panel ON, 1 = user panel OFF when controlled by MIDI CC (obsolete)
		999	0..1	999=1, 999?	0	Local Lockout, 0 = user panel ON, 1 = user panel OFF for remote control by serial interface
		1000..1255				Upper Preset Table Bulk, 16 values per preset patch
		1256..1511				Lower Preset Table Bulk, 16 values per preset patch

						<b>Mit Vorsicht verwenden - FPGA-Konfiguration kann hierdurch unbrauchbar werden! Caution! Imprudent use of following commands may render FPGA configuration useless!</b>
DFP	0..1	9900, 9901		DFP = 4!		PB core config, 9901 = with serial output for debug use
DFC	--	9910	--	DFC?		DataFlash Config, FPGA Reconfiguration from DataFlash
DFS	--	9920		DFS?, DFS=0!		Read DataFlash status or DataFlash write enable mit "DFS=0!" (set write protect OFF)
DFX	0..1	9930, 9931		DFX = 0, DFX 1=3!	XMODEM-Anford.	DataFlash FPGA config (Ar.g=0, absolute block number given by parameter) or PB core (Arg.=1, relative block number/CoreSel after FPGA config data) by XMODEM128 (checksum) receive
DFF	0..2	9940..9942		DFF 2=0		DataFlash Erase, Arg. 0 = without offset, 1 = block after FPGA config data, 2 = chip erase (will erase scan cores as well!)
SFX		9960		SFX=10		SPIN EEPROM Config from Flash Core Block
KEY	0	9950		9950=1234567, 9950?		enter/request licence code for organ
KEY	1	9951		9951=7654321		enter/request licence code for Leslie

Legende      \*write only      \*\* read only  
Factory Defaults may change without notice!

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