

iC-NQ EVAL NQ1D

EVALUATION BOARD DESCRIPTION



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ORDERING INFORMATION

Type	Order Designation	Description Options
Evaluation Board	iC-NQ EVAL NQ1D	iC-NQ Evaluation Board ready-to-operate, accessible through GUI via PC adapter
Software	iC-NQ GUI	NQ1D Evaluation Board Software PC program to configure iC-NQ and the configuration EEPROM; download at www.ichaus.com
	BiSS GUI	BiSS Master Software universal PC program to configure master boards and sensors; download at www.ichaus.com
PC Adapter	iC-MB3 iCSY MB3U	PC Adapter with BiSS Master function for PC USB port, including USB A-B cable
	iC-MB3 iCSY MB3A	PC Adapter with BiSS Master function for PC parallel printer port, supplied without interface cable

BOARD NQ1D

(size 100 mm x 80 mm)

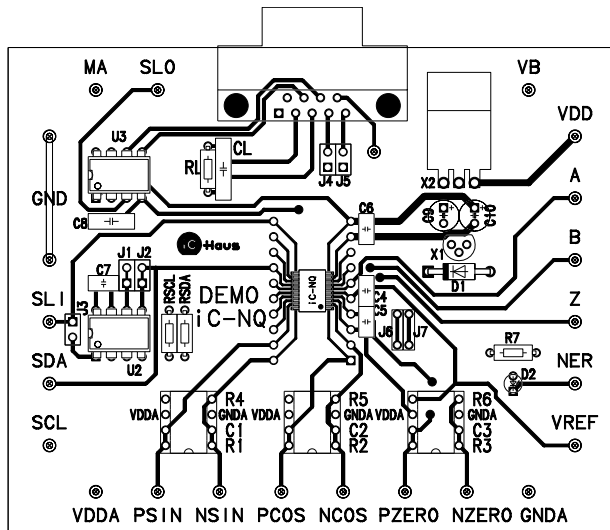


Figure 1: Component side

TERMINAL DESCRIPTION

VDD	+5 V Supply Voltage (ca. 10 to 25 mA, with MB3A ca. 130 mA)
VDDA	+5 V Supply Voltage (analog)
VB	+8... +15 V Supply Voltage (series regulator mounted)
VREF	Reference Voltage Output
GND	Supply Ground
GND A	Reference Ground (analog)
SLO	BiSS interface, data output
MA	BiSS interface, clock interface
SLI	BiSS interface, data input
SDA	EEPROM interface, data line
SCL	EEPROM interface, clock line
PSIN	Input Sine +
NSIN	Input Sine -
PCOS	Input Cosine +
NCOS	Input Cosine -
PZERO	Input Zero Signal +
NZERO	Input Zero Signal -
NER	Error Input/Output, active low
A	Incremental Output A
B	Incremental Output B
Z	Index Output Z

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ASSEMBLY PART LIST

Device	Value (typical)	Comment
J1, J2, J6, J7	shorted	
J3, J5	open	
J4	Jumper	see section jumper description
U1	iC-NQ TSSOP20	13-bit Sin/D converter
U2	24C02	EEPROM
U3	65LBC179	line driver
R1 to R6, C1 to C4		to be mounted depending on the configuration
R7	1 k Ω	
RL	120 Ω	line termination
CL		line termination
C5, C6, C7	100 nF	
C8	1 μ F	
D2	LED RED	error indicator LED
X1	7805	voltage regulator - optional -
X2	78L05	voltage regulator - optional -
RSDA, RSCL	5 k Ω	I ² C line pull-ups

CONNECTOR PINOUT AND TERMINAL DESCRIPTION

S1: BiSS Interface Input/Output

9-pin Sub D Connector - female

PIN	Name	Function
1	VB	+8... +15 V Supply Voltage
2	MA +	Master clock input
3	MA -	Master clock input (inverted)
4	VDD	+5 V Supply Voltage
5	SHIELD	Cable Shield
6	GND	0 V Ground
7	SL +	Slave data
8	SL -	Slave data (inverted)
9	NC	Not connected

JUMPER DESCRIPTION

Following configurations are recommended to supply the iC-NQ evaluation board. Other than the given configurations may damage the iC-NQ evaluation board, the BiSS interface adapter and/or your PC hardware.

Voltage supply options with adapter iC-MB3 iCSY MB3A

Voltage supply			Jumper configuration	Component supply
via board terminal ¹	via board terminal ²	via MB3A ⁴	J4	iC-NQ and MB3A
VB	VDD			
-	X	n/a	bridged	via board terminal VDD
X	-	n/a	bridged	via board terminal VB

Voltage supply options with adapter iC-MB3 iCSY MB3U

Voltage supply			Jumper configuration	Component supply
via board terminal ¹	via board terminal ²	via MB3U ³	J4	iC-NQ
VB	VDD			
-	-	X	bridged	via MB3U (S1, pin 4, +5 V)
-	-	X	open	via MB3U (S1, pin 1, +12 V) with assembled X1/X2 voltage regulator circuit components
-	X	-	open	via board terminal VDD

Jumper configuration J5	Comments
open	Cable shield open
bridged	Cable shield connected to ground terminal GND

- Notes
- 1) Supply of +8 V to +15 V required to board terminals VB and GND. Assembly of voltage regulator is required
 - 2) Supply of +5V required to board terminals VDD and GND
 - 3) Supply voltage sourced from USB port
 - 4) MB3A is supplied via the BiSS connector of the NQ1D board

APPLICATION SOFTWARE

Software

iC-NQ software for PCs running on Windows operating systems, as well as the required USB and/or LPT driver are available as a ZIP file. The installation of the software starts by executing the iC-NQ_xx.msi installation package. USB and/or LPT driver need to be installed to access the evaluation board via the PC adapter. After the installation process iC-NQ_xx.exe is available in the selected working directory. The execution of this file will start the control software.

Download link

<http://www.ichaus.de/product.php?prod=iC-NQ>

BIOS Setup

"Bi-Directional" or "EPP" (eg. under Win NT) must be selected in the BIOS for the bidirectional operation of the parallel interface. Setting the BIOS to "Normal" alone is not sufficient. Typical DMA settings are: ECP DMA select 3, on-board parallel interface address 378h with interrupt Q7. These steps are not required when using the USB adapter iC-MB3 iCSY MB3U.



Figure 3: GUI Screenshot

Software Description

Menu Section

	Button	Description
<File>	Exit	Close the iC-NQ software
	Load File	Chip configuration I/O, Intel Hex file format (*.hex)
	Save File	Intel format, suits most EEPROM programmers
	Save BiSS Master Config	Stores the iC-MB3 master chip configuration as *.cfg
<Mode>	No Hardware	Mode must be set in accordance to the adapter in use. See Note 5 .
	BiSS-Master / Intel-Mode	Eval Board MB3D-P, BiSS Master FPGA Board SY1D
	BiSS-Master / Motorola-Mode	MB3D-P (jumper S2 altered), SY1D (jumper J3 altered)
	BiSS-Master / SPI-Mode	BiSS PC-LPT Adapter MB3A, Eval Board MB3D-S
	BiSS-Master / USB-SPI	PC-USB Adapter iC-MB3 iCSY MB3U
<Extra>	Enable R/O Window	Selects for a separate position data output window
	Set OscFreq	Permits entries for iC-NQ's Elec. Char. item no. A01 (applied to calculate Max FIN and Min EDGEDIST)
	Config SSI/BiSS-Mode	See iC-NQ data sheet for parameters SELSSI, CFGSSI(1:0)
	Select NQL-Mode	Enables the Software to setup communication with iC-NQL
	Set identifier (NQ version)	Enables the Software to setup communication with the selected IC

Middle Section

Button	Description
Read Output	Start/stop of data transfer (Slave → BiSS MAster → PC)
Initialize	BiSS device initialization (output of single clock pulse)
Config BiSS Slave-ID	Use "0" when only one iC-NQ is connected By a higher slave ID a r/w access to registers of further iC-NQ's connected in chain is possible (BiSS network)
AutoGetSens	Releases the BiSS Master to cyclically repeat sensor mode data transfers (Slave → BiSS Master)
Enable internal clock	Use of internal RC clock or ext. clock oscillator (BiSS Master)
FrequSens	Sensor mode clock frequency
FrequReg	Register mode clock frequency
AutoGetSens Cycle Time	Interval time for sensor mode cycles

Lower Section - Configuration -

Button	Description
<Name of the iC-NQ parameter>	Please refer to the iC-NQ data sheet
FCTR	Parameter selecting the maximum tracking rate (default 0004h). Please refer to the iC-NQ data sheet for permissible entries. A selection for MaxFIN or Min EDGEDIST automatically displays and transmits a corresponding entry for the FCTR register.
MaxFIN	Selection list entries are calculated from the current SELRES, FCTR and MIN OSCFREQ settings (see menu extra). A selection for MaxFIN automatically displays and transmits a corresponding entry for the FCTR register.
Min EDGEDIST	Selection list entries are calculated from current SELRES, FCTR and MAX OSCFREQ settings (see menu extra). A selection for Min EDGEDIST automatically displays and transmits a corresponding entry for the FCTR register.
Identifier	BiSS device manufacturer ID and product code. Can be edited and stored to the configuration EEPROM (Write E ² prom).
AMPL	Thresholds for monitoring the sensor signal. Selections are stored under SELAMPL and AMPL.

Amendments to individual parameters are transferred immediately to iC-NQ's registers (RAM)

Bottom Line Buttons

Read Param	Reads in iC-NQ's current configuration (iC-NQ Ram → PC)
Write Param	Transfers the setup displayed on screen to iC-NQ (PC → RAM)
Load File	Reads in a configuration file (*.hex)
Save File	Stores the displayed configuration to file (*.hex)
Write E ² prom	Writes the setup displayed on the screen to the EEPROM connected to iC-NQ. It also transfers the CRC value calculated by the software to the EEPROM.

Notes ⁵⁾ In "No Hardware" mode settings for all parameters can be made and saved with the "Save File" button as an Intel.hex file. Using an external programming device it is then possible to create a configuration EEPROM.

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RELATED DOCUMENTS

- iC-NQ Data Sheet - Specification -
 - iC-NQ GUI - GUI software for Windows PC -
- <http://www.ichaus.de/product.php?prod=iC-NQ>

- iC-MB3 iCSY MB3U - PC-USB ADAPTER -
 - iC-MB3 iCSY MB3A - PC-LPT ADAPTER -
- <http://www.ichaus.de/product.php?prod=MB3A/MB3U>

REVISION HISTORY

Rev	Notes	Pages affected
B4	Obsolete	
C1	Introduces C1 GUI software	all
C2	Ordering Information changed	1

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