

iC-HT EVAL HT1D EVALUATION BOARD DESCRIPTION

preliminary

ORDERING INFORMATION

Type	Order Designation	Description Options
Evaluation Board	iC-HT EVAL HT1D	iC-HT Evaluation Board ready to operate, accessible through GUI via USB including USB A-B cable
Software	iC-HT GUI	GUI software for Windows PC communication to iC-HT, program and read data see chapter EVALUATION SOFTWARE on page 7 for more information

BOARD HT1D AND TERMINAL DESCRIPTION

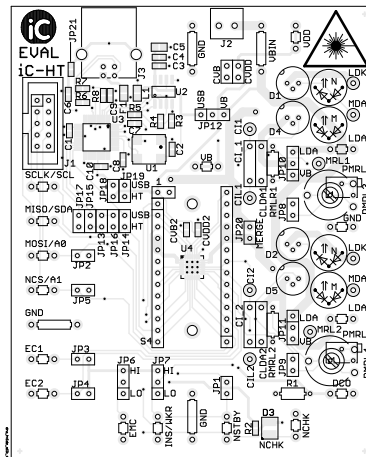


Figure 1: Component side (size 100 mm x 80 mm)

TERMINAL DESCRIPTION

J1	SPI / I ² C Interface
J2	VB Power Supply
J3	USB Interface
S4	iC-HT
LDK1	Laser Diode Cathode for channel 1
CI1	Integration capacitor for Channel 1
CIL1	Integration capacitor low for Channel 1
MDA1	Monitor Diode Anode for Channel 1
MRL1	Monitor Resistor Low for channel 1
EC1	Enable Channel 1 Input
LDK2	Laser Diode Cathode for channel 2
CI2	Integration capacitor for Channel 2
CIL2	Integration capacitor low for Channel 2
MDA2	Monitor Diode Anode for Channel 2
MRL2	Monitor Resistor Low for channel 2
EC2	Enable Channel 2 Input
VBIN	Power Supply
VDD	3.3 V output Supply
GND	Ground
EMC	Enable Microcontroller Input
SCLK/SCL	SPI Clock / I ² C Clock
MISO/SDA	SPI Master In Slave OUT / I ² C Data
MOSI/A0	SPI Master Out Slave In / I ² C Address Bit 0
NCS/A1	Chip Select(low active) / I ² C Address bit 1
INS/WKR	I ² C not SPI Input / WK Reference
DCO	Digital Current Out
NCHK	Check Output(low active)
NSTBY	Standby Input(low active)

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CIRCUIT DESCRIPTION

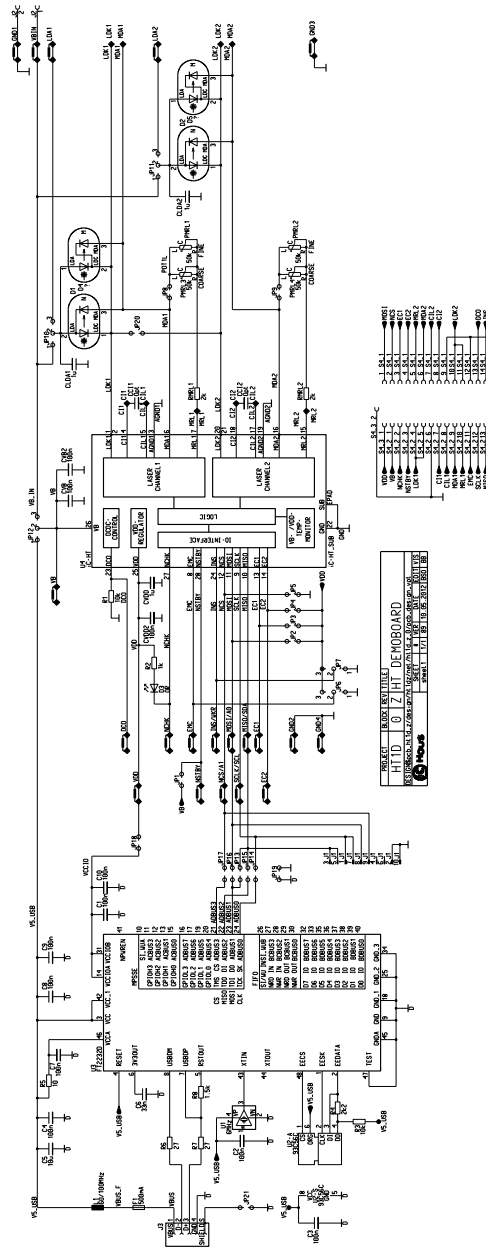


Figure 2: Circuit diagram

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BOARD AND CONNECTOR PINOUT

J1: IC-HT SPI / I²C signals

10-pin connector - male

PIN	Name	Function
J1_1	SCKL	SPI Clock
J1_2	GND	Digital Ground
J1_3	MISO	Master Input Slave Output
J1_4	n.c.	Reserved
J1_5	MISO	Master Input Slave Output
J1_6	n.c.	Reserved
J1_7	SCKL	SPI Clock
J1_8	MOSI	Master Output Slave Input
J1_9	NCS	SPI Chip Select
J1_10	GND	Digital Ground

J2: VDD Power Supply

2-pin connector - female

PIN	Name	Function
1	VB	Supply
2	GND	Ground

J3: USB signals

4-pin connector - male

PIN	Name	Function
1	VBUS	5 V USB power
2	D-	USB Data -
3	D+	USB Data +
4	GND	5 V USB ground
S1	SHIELD	USB cable shield

D1: N-Type Laser Diode Connector Channel 1

3-pin connector - female

PIN	Name	Function
1	LDC	Laser Diode Cathode
2	LDA	Laser Diode Anode
3	MDA	Monitor Diode Anode

D2: N-Type Laser Diode Connector Channel 2

3-pin connector - female

PIN	Name	Function
1	LDC	Laser Diode Cathode
2	LDA	Laser Diode Anode
3	MDA	Monitor Diode Anode

D4: M-Type Laser Diode Connector Channel 1

3-pin connector - female

PIN	Name	Function
1	LDA	Laser Diode Anode
2	LDC	Laser Diode Cathode
3	MDA	Monitor Diode Anode

D5: M-Type Laser Diode Connector Channel 2

3-pin connector - female

PIN	Name	Function
1	LDA	Laser Diode Anode
2	LDC	Laser Diode Cathode
3	MDA	Monitor Diode Anode

S4: IC-HT signals + thermal pad

20-pin connector - male

PIN	Name	Function
S4_1_1	MOSI	
S4_1_2	NCS	
S4_1_3	EC1	
S4_1_4	EC2	
S4_1_5	MRL2	
S4_1_6	MDA2	
S4_1_7	CIL2	
S4_1_8	CI2	
S4_1_9	ANGD2	Connected to GND
S4_1_10	LDK2	Connected to S4_1_11
S4_1_11	LDK2	Connected to S4_1_10
S4_1_12	GND	
S4_1_13	DCO	
S4_1_14	INS	
S4_2_1	VB	
S4_2_2	NCHK	
S4_2_3	NSTBY	
S4_2_4	LDK1	Connected to S4_2_5
S4_2_5	LDK1	Connected to S4_2_4
S4_2_6	AGND1	Connected to GND
S4_2_7	CI1	
S4_2_8	CIL1	
S4_2_9	MDA1	
S4_2_10	MRL1	
S4_2_11	EMC	
S4_2_12	SCLK	
S4_2_13	MISO	
S4_3_1	VDD	
S4_3_2	TP	Thermal pad connected to GND

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JUMPER DESCRIPTION

Jumper	Pin 1	Pin 2	Default Setting
JP1	VB	iC-HT NSTBY	JP1 connects NSTBY to VB for operation
JP2	VDD	iC-HT MOSI	Pull-up MOSI/A0
JP3	VDD	iC-HT EC1	Pull-up EC1
JP4	VDD	iC-HT EC2	Pull-up EC2
JP5	GND	iC-HT NCS	Pull-down NCS/A1
JP8	MDA1	PMRL3, PMRL1	Enable external resistor (potentiometers coarse/fine + MRL min) channel 1
JP9	MDA2	PMRL4, PMRL2	Enable external resistor (potentiometers coarse/fine + MRL min) channel 2
JP13	ADBUS1	iC-HT MISO	Enable MOSI A0 USB = MISO/SDA USB
JP14	ADBUS0	iC-HT SCLK	Enable SCLK/SCL USB
JP15	ADBUS2	iC-HT MISO	Enable MISO/SDA USB
JP16	ADBUS1	iC-HT MOSI	Enable MOSI/A0 USB
JP17	ADBUS3	iC-HT NCS	Enable NCS/A1 USB
JP18	VCCIO	VDD	Serial communication port of FT2223D supplied by VDD iC-HT
JP19	GNDD_USB	iC-HT GND	Serial communication port of FT2223D GND(FTDI) = GND(iC-HT)
JP20	iC-HT LDK1	iC-HT LDK2	Connection LDK1 and LDK2
JP21	Shield J3	GNDD_USB	USB Connector J3 shield to GND

Jumper	Pin 1	Pin 2	Pin 3	Default Setting
JP6	GND	iC-HT EMC	VDD	Pull-up/open/pull-down (tri-state) EMC
JP7	GND	iC-HT INS	VDD	Pull-up/open/pull-down (tri-state) INS/WKR
JP10	VB_IN	iC-HT LDA D1/D4	LDA1	LDA1 for D1 / D4 supply
JP11	VB_IN	iC-HT LDA D2/D5	LDA2	LDA2 for D2 / D5 supply
JP12	V5_USB	iC-HT VB	VB_IN external VB	VB_IN = VB for iC-HT

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INTERFACE SELECTION

The iC-HT evaluation board can be operated with SPI or I²C protocol using the board USB-to-serial interface.

Default Jumper Setting

The default jumper setting of the iC-HT evaluation board is set to be operated with the on board USB-to-SPI interface. The channel 1 and channel 2 are directly enabled. No channel merge. Standby is disabled. No on board resistors/potentiometer in the feedback path. The laser diodes are VB supplied.

*Attention: External power supply on VB_IN and GND required!

The default jumper configuration requires a VB power supply at "VB_IN" and "GND" for operation.

Jumper	Jumper State	Default Setting
JP1	Closed	Operation, no standby: NSTBY connected to VB
JP2	Open	No pull-up MOSI/A0: USB-SPI defines NCS
JP3	Closed	Enable Channel 1: channel 1 enabled
JP4	Closed	Enable Channel 2: channel 2 enabled
JP5	Open	No pull-up NCS/A1: USB-SPI defines NCS
JP6	"HI": 2=3 Closed	Enable microcontroller: EMC high
JP7	"LO": 1=2 Closed	Enable SPI: INS low
JP8	Open	Disable potentiometers channel 1
JP9	OPpen	Disable potentiometers channel 1
JP10	"VB": 1=2 Closed	Use VB supply for LDA1, not LDA2 (states "VB")
JP11	"LDA": 1=2 Closed *	Use VB supply for LDA2, not LDA2 (states "LDA")*
JP12	"VB": 2=3 Closed	Use VB supply, not USB supply
JP13	Open	Enable MOSI A0 USB = MISO/SDA USB
JP14	Closed	Enable SCLK/SCL USB
JP15	Closed	Enable MISO/SDA USB
JP16	Closed	Enable MOSI/A0 USB
JP17	Closed	Enable NCS/A1 USB
JP18	Closed	Serial communication port FT2223D is supplied by VDD of iC-HT
JP19	Closed	Serial communication port FT2223D GND = GND iC-HT
JP20	Open	LDK1 and LDK2 are not connected
JP21	Open(not present)	USB connector J3 shield to GND, solderable jumper/resistor

*Attention to JP11: Error on PCB Top Text of JP11

The PCB text "VB" and "LDA" of Jumper JP11 has a wrong pin mapping and text meaning need to be swapped for correct jumpering.

- JP10 1=2 for "VB", 2=3 for "LDA1".
- JP11 1=2 for "VB", 2=3 for "LDA2".

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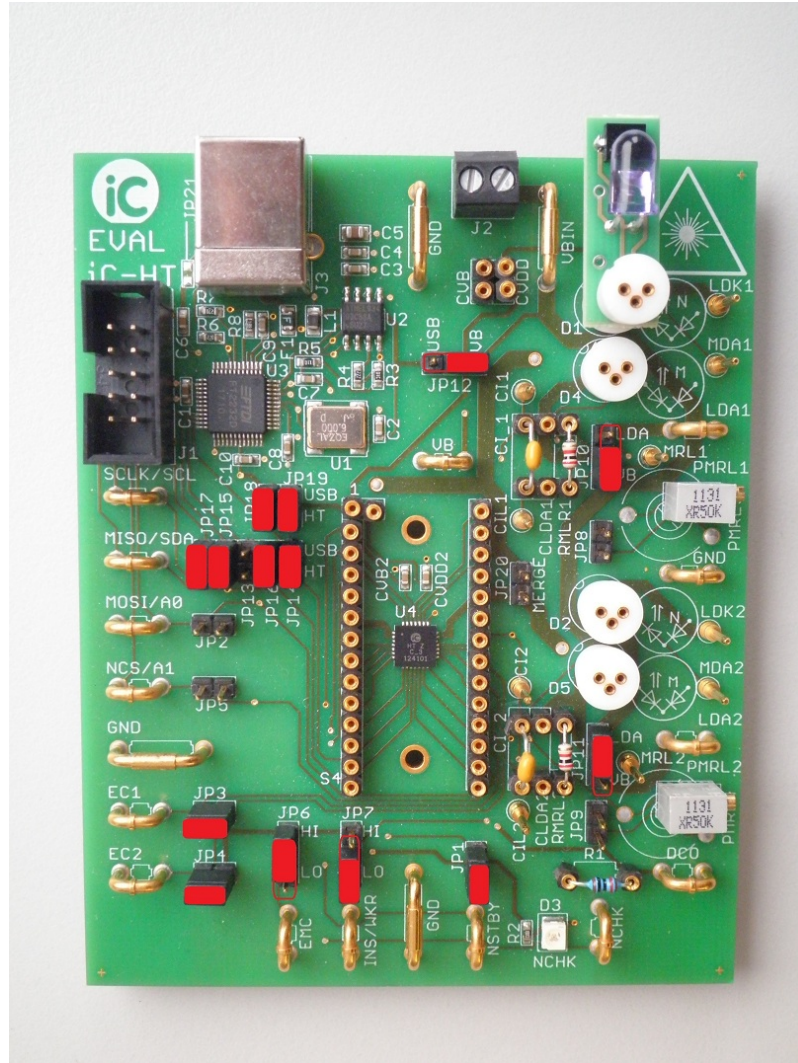


Figure 3: iC-HT eval board default jumper setting

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EVALUATION SOFTWARE

iC-HT software for PCs running on Windows operating systems, as well as the required USB driver are available as a ZIP file. iC-Haus software built with LabVIEW™ requires the installation of the LabVIEW™ Run-Time Engine (RTE). The RTE must be installed only once, hence there are two download links available.

Software overview online: <http://www.ichaus.de/software>

Download package	without RTE (small size)	including RTE (big size)
iC-HT:	http://www.ichaus.de/HT_gui	http://www.ichaus.de/HT_gui_rte

Features

- Reducing evaluation time and design-in time and cost
- Reading and displaying of parameter and status
- Manually setting up parameters of iC-HT
- Export and import of iC-HT parameters settings to/from files
- Export of software and user activity logbook to textfiles
- Export of automated report ZIP including windows and tabs content, logbook and device configuration

Installation

After unzipping the iC-HT software package HT1SO_gui_xx resp. HT1SO_gui_xxрте, the following files are located in the selected working directory.

xx is a placeholder for revisions

- Subfolder HT1SO_gui_xx including the executable setup.exe which starts the installation routine.
- Driver packages for iC-HT evaluation board and/or other iC-Haus USB adapter devices.

Note: Administrator rights are required to run installations.

Note: Please install the latest USB driver **before** you connect the iC-HT evaluation board to the PC USB.

1. To access the iC-HT evaluation board, interface drivers for USB need to be installed. Before connecting the iC-HT evaluation board to your PC the driver installation must be completed successfully.

→ Execute the USB_xx.exe installation package and follow the on-screen instructions. This can take a few minutes.

1.1 The driver installation has to be done and finished completely before connecting the iC-HT evaluation board to the PC USB.

2. Install the evaluation software HT1SO by executing the setup.exe located in the subfolder HT1SO_gui_xx.
→ Follow the on-screen instructions to finish the installation.

3. After installation the executable HT1SO_gui_xx.exe will be available in the selected working directory. Figure 4 shows a screenshot of the evaluation software.

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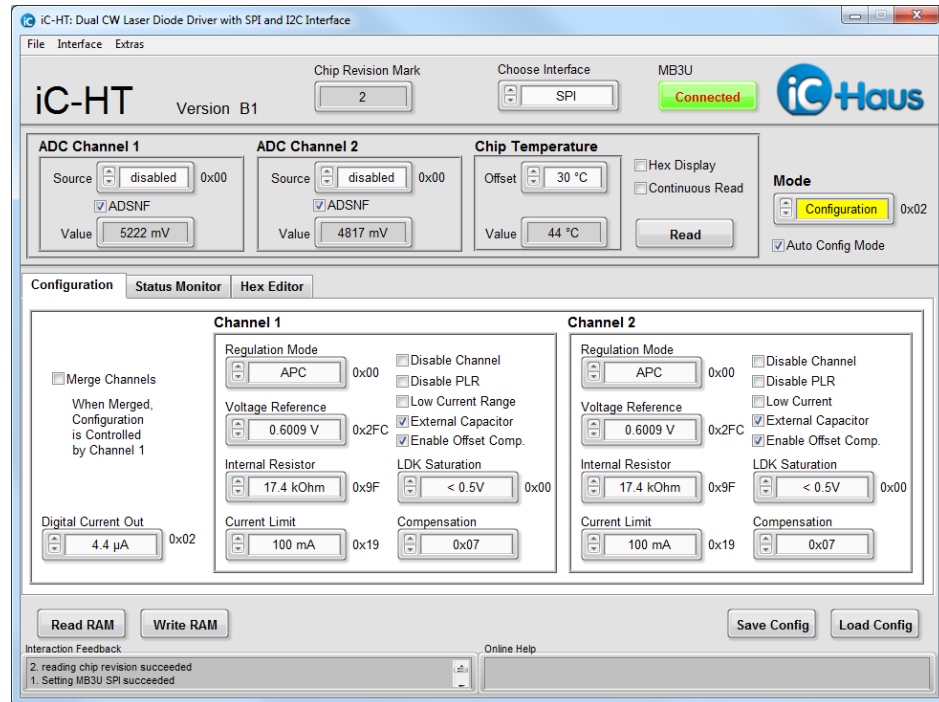


Figure 4: iC-HT evaluation software

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ASSEMBLY PART LIST

Device	Value (typical)	Comment
C5,	10 μ F	Tantal 10 V, tolerance 20 %
C1...4, C7...10, CVB, CVB2, CVDD2	100 nF	X7R 10 V, tolerance 10 %
C6	33 nF	X7R 10 V, tolerance 10 %
CLDA1, CLDA2, CVDD,	1 μ F	X7R 10 V, tolerance 10 %
D3	LED	Indicator LED (orange) for WARN pin
F1	500 mA / 6 V	Fuse
J1	WSL10	10 pin connector male
J2	AKL059-2	2 pin connector terminal screwable
J3	USB B	USB input connector
S4	WSL29	RM socket connector
JP1...5, JP8, JP9, JP13...21	SLLP10972G	Jumper 2 pins
JP6, JP7, JP10...12	SLLP10976G	Jumper 3 pins
L1	40 Ω /100 MHz	Ferrit bead
R5	10 Ω	tolerance 5 %
R6, R7	27 Ω	tolerance 5 %
R2	1 k Ω	tolerance 5 %
R8	1.5 k Ω	tolerance 5 %
RMRL1, RMRL2	2.0 k Ω	tolerance 5 %
R4	2.2 k Ω	tolerance 5 %
R1, R3	10 k Ω	tolerance 5 %
R	470 k Ω	tolerance 5 %
U1	6 MHz	Crystal oscillator
U2	93C56C	2K microwire EEPROM
U3	FT2232	USB interface device
U4	iC-HT	Dual CW laser diode driver

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RELATED DOCUMENTS

- iC-HT Data Sheet - Specification -
- iC-HT GUI - GUI software for Windows PC -
- iC-HT DLL - Library Description -

ERRATA

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The PCB text "VB" and "LDA" of Jumper JP11 has a wrong mapping and text meaning needs to be swapped.

REVISION HISTORY

Rev	Notes	Pages affected
A1	Initial version	

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