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Application Note #34:

An Overview of Opticon OEM Scan Engine Modules, the Module Evaluation Boards, MEK Evaluation Kits and the differences between them all.



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6	<i>ADDED MDI 4X5X, MDI5010 , REMOVED MDL2500 & OLD Z BRACKET</i>	<i>ALL</i>	<i>JUN - 2020</i>	<i>JOG</i>

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Introduction & Overview

Opticon, Inc. has developed various “Module Evaluation Kits” (MEK). These kits allow a customer to evaluate various scan modules (bar code scan engines) from Opticon. There are several types of MEK board designs and they have different sizes, connection types and capabilities. This document will describe the various MEK boards and their subtle differences.

Some of these MEK boards are generic in purpose; such that they were designed with a one-board-fits-all type purpose. Other boards are more specific as they only work for certain modules and for specific communication interface modes. Some of these evaluation boards are small enough and cost effective enough to be purchased along with each module as a complete interface board for OEM installations.

While Opticon sells both decoded and un-decoded modules, the scope of this document only covers the decoded scan modules and their associated MEK boards.

Section 1: Current Modules

This section describes the current modules available by Opticon at this time. Each scan module has a zero insertion force type connector (ZIF) used to house a flat flex cable (FFC) [not included with the module] that is used for power and communications with the host computer or control device. The number of pins in the ZIF connectors are listed in the picture table below. Some modules have the capability of both Serial and USB communication modes. Modules marked with (*) will not convert interface types – you must order the I/F type separately. The modules noted with a (**) are I/F mode selectable (TTL232/USB) by scanning a special menu code.

MDC100**	MDC200/210**	MDL100	MDL1000
			
Technology: CCD (1D) ZIF Pin Qty: 12-pin	CCD (1D) 12-pin	Laser (1D) 12-pin	Laser (1D) 12-pin
MDL1500**	MDL2001	MDL4000*	
			
Laser (1D) 12-Pin	Laser (1D) 12-Pin (serial 232 only)	Laser (1D) 12-Pin (serial 232) or (USB) <i>must order separately</i>	
MDI1000	MDI2300	MDI2350	
			
Imager (1D/2D) 30-pin	Imager (1D/2D) 17-pin	Imager (1D/2D) 17-pin	
MDI3000**	MDI3100**	MDI3200**	MDI3300**
			
Imager (1D/2D) 12-pin	Imager (1D/2D) 12-pin	Imager (1D/2D) 12-pin	Imager (1D/2D) 12-pin
MDI4000/4050	MDI4100/4150**	MDI4300/4350**	MDI5010**
			
Imager (1D/2D) 12-pin	Imager (1D/2D) 12-pin	Imager (1D/2D) 12-pin**	Imager (1D/2D) 12-pin

MODULE FEATURE COMPARISON TABLE

Product	1D Decoding	2D Decoding	Integrated Decoder Board	SCAN Technology	Power Voltage (Typ.)	Current* (Sleep Mode - Typ)	Current* (Idle Mode - Typ)	Current Operating* (Typ)	Aliming Method	Illumination Source	Laser Class	Image Sensor Size	Shutter technology	Focus	Field of View (H x V).Laser (readable) Scan Width (H)	Scans Per Second	Frames Per Second	COMM: 232 Serial	COMM: USB-HID	COMM: USB-COM	FFC Connector Size (contacts)	Apx Size mm (W-xHxD)	Operational Temperature Range	MTBF (Hours)
MDC100	Y	N	Y	CCD	3.3V	100uA	18mA	110mA	None	1 Red LED Bar	N/A	1x1500	Shift	110mm	50°	300	N/A	Y	Y	Y	12	23x12x15	-20 to 60°C	100,000
MDC200	Y	N	Y	CCD	3.3V	100uA	25mA	110mA	None	1 Red LED Bar	N/A	1x1500	Shift	110mm	50°	300	N/A	Y	Y	Y	12	23x8x15	-20 to 60°C	100,000
MDC210	Y	N	Y	CCD	3.3V	100uA	25mA	110mA	None	1 Red LED Bar	N/A	1x1500	Shift	TBD	75°	300	N/A	Y	Y	Y	12	23x8x15	-20 to 60°C	100,000
MDI1000	Y	Y	N	CMOS	3.3V	25mA	125mA	310mA	Green LED	4 Red LEDs	N/A	1280x1024	Rolling	120mm	47° x 38°	N/A	30	Y	Y	Y	30	*22x12x14	-20 to 55°C	50,000
MDI1002	Y	Y	N	CMOS	3.3V	25mA	125mA	310mA	Green LED	4 Red LEDs	N/A	1280x1024	Rolling	60mm	47° x 38°	N/A	30	Y	Y	Y	30	**22x12x14	-20 to 55°C	50,000
MDI2300	Y	Y	N	CMOS	3.3V	15mA	70mA	240mA	Laser Spot	1 Red LED	Class 1	900x512	Rolling	AUTO	43° x 23°	N/A	80	Y	Y	Y	17	**27x14x13	-20 to 55°C	10,000
MDI2350	Y	Y	N	CMOS	3.3V	15mA	70mA	240mA	Laser Spot	1 Red LED	Class 1	1280x1024	Rolling	120mm	47° x 38°	N/A	30	Y	Y	Y	17	**27x14x13	-20 to 55°C	10,000
MDI3000-SR	Y	Y	N	CMOS	3-5.5V	0.2mA	45mA	230mA	Green LED	Amber LED	N/A	752x480	Global	130mm	41° x 26°	N/A	60	Y	N	N	12	**22x12x14	-30 to 60°C	53,310
MDI3100-SR	Y	Y	Y	CMOS	3-5.5V	0.2mA	45mA	230mA	Green LED	Amber LED	N/A	752x480	Global	130mm	41° x 26°	N/A	60	Y	Y	Y	12	25x12x21	-30 to 60°C	53,310
MDI3100-HD	Y	Y	Y	CMOS	3-5.5V	0.2mA	45mA	230mA	Green LED	Amber LED	N/A	752x480	Global	70mm	41° x 26°	N/A	60	Y	Y	Y	12	25x12x21	-30 to 60°C	53,310
MDI3200	Y	Y	N	CMOS	3-5.5V	0.2mA	45mA	230mA	Laser cross	1 Red LED	Class 1	752x480	Global	120mm	41° x 26°	N/A	60	Y	Y	Y	12	**22x12x14	-20 to 60°C	62,000
MDI3300	Y	Y	Y	CMOS	3-5.5V	0.2mA	45mA	230mA	Laser cross	1 Red LED	Class 1	752x480	Global	120mm	41° x 26°	N/A	60	Y	Y	Y	12	25x12x21	-30 to 60°C	57,000
MDI4000-SR	Y	Y	N	CMOS	3-5.5V	12mA	28mA	300mA	Green LED	White LED	N/A	640x480	Global	115mm	38° x 29°	N/A	100	Y	Y	Y	12	**25x6x14	-30 to 60°C	>50,000
MDI4100-SR	Y	Y	Y	CMOS	3-5.5V	12mA	28mA	300mA	Green LED	White LED	N/A	640x480	Global	115mm	38° x 29°	N/A	100	Y	Y	Y	12	25x10x21	-30 to 60°C	>50,000
MDI4100-HD	Y	Y	Y	CMOS	3-5.5V	12mA	28mA	300mA	Green LED	White LED	N/A	640x480	Global	65mm	38° x 29°	N/A	100	Y	Y	Y	12	25x10x21	-30 to 60°C	>50,000
MDI4100-UD	Y	Y	Y	CMOS	3-5.5V	12mA	28mA	300mA	Green LED	White LED	N/A	640x480	Global	45mm	38° x 29°	N/A	100	Y	Y	Y	12	25x10x21	-30 to 60°C	>50,000
MDI4300-SR	Y	Y	Y	CMOS	3-5.5V	12mA	28mA	300mA	Green LED	White LED	N/A	640x480	Global	115mm	38° x 29°	N/A	100	Y	Y	Y	12	25x12x21	-30 to 60°C	>50,000
MDI5010MR	Y	Y	N	CMOS	3-5.5V	1.7mA	24mA	390mA	Green LED	White LED	N/A	1280x800	Global	165mm	48° x 31°	N/A	120	Y	Y	Y	12	**22x12x13	-20 to 60°C	>100,000
MDL100	Y	N	Y	LASER	3.3V	1.4mA	30mA	110mA	Laser Spot	Laser	Class 2	N/A	N/A	N/A	44°	100	N/A	Y	?	?	12	28x8x18	-20 to 65°C	10,000
MDL1000	Y	N	Y	LASER	3.3V	2mA	30mA	110mA	Laser Spot	Laser	Class 2	N/A	N/A	N/A	44°	100	N/A	Y	N	N	12	28x8x18	-20 to 65°C	10,000
MDL1500	Y	N	Y	LASER	3.3V	50uA	30mA	110mA	Laser Spot	Laser	Class 2	N/A	N/A	N/A	44°	100	N/A	Y	?	?	12	28x8x14	-20 to 65°C	30,000
MDL2001	Y	N	Y	LASER	3.3V	2mA	30mA	110mA	Laser Spot	Laser	Class 2	N/A	N/A	N/A	44°	100	N/A	Y	N	N	12	20x11x18	-20 to 65°C	10,000
MDL4000R1	Y	N	Y	LASER	3.3V	500uA	40mA	85mA	Laser Spot	Laser	Class 1	N/A	N/A	N/A	44°	100	N/A	Y	N	N	12	20x14x6	-20 to 65°C	10,000
MDL4000U1	Y	N	Y	LASER	3.3V	500uA	40mA	85mA	Laser Spot	Laser	Class 1	N/A	N/A	N/A	44°	100	N/A	N	Y	Y	12	20x14x6	-20 to 65°C	10,000

*Currents measured at Vcc = 3.3V

** These are three piece products (Camera head, flex cable & decoder board). The measurement is the camera head size only.

TABLE 1 – SCAN ENGINE MODULE COMPARISON TABLE

Module Part Numbers & Ordering

Below is a list of all the scan module possibilities and their part number for ordering. If you order a “SK#” kit, it will include one of these module types. The ‘Range’ column refers to the optics capability of the module. “SR” is “Standard Range” and “HD” has a closer focus so it is better at decoding “High Density” symbologies. The “FFC Type” column refers to the Flat Flex cable type that is required (included in the SK kits shown in the next section). The type “A-A” means that the conductors are on the same side of the cable. Type “A-B” means that the conductors are on the opposite side of the cable. The “CN-#” column refers to the connector Number or identifier on the MEK board.

CCD Modules:



Opticon Part # For Module only	Model / Description	Interface	FFC pins	FFC Type	Order Part # for MEK EVAL Board *	MEK Board used
MDC100R1-00	MDC100, Opto FW	RS232	12	A-B	MDC100R1-SK2	MEKmini2
MDC100U1-00	MDC100, Opto FW	USB-HID	12	A-B	MDC100U1-SK2	MEKmini2
MDC100U2-00	MDC100, Opto FW	USB-COM	12	A-B	MDC100U2-SK2	MEKmini2
MDC200R1-00	MDC200, Opto FW	RS232	12	A-B	MDC200R1-SK2	MEKmini2
MDC200U1-00	MDC200, Opto FW	USB-HID	12	A-B	MDC200U1-SK2	MEKmini2
MDC200U2-00	MDC200, Opto FW	USB-COM	12	A-B	MDC200U2-SK2	MEKmini2

*These modules use the MEKmini2 board assembly on top of the MEKbase1 board

Laser Modules:



Opticon Part # For Module only	Model / Description	Interface	FFC pins	FFC Type	Order Part # for MEK EVAL Board	MEK Board used
MDL400R1-01	MDL4000, Opto FW	RS232	12	A-A	MDL400R1-SK1	MEK1001
MDL400R1-02	MDL4000, OSE FW	RS232	12	A-A	MDL400R1-SK2	MEK1001
MDL400U1-01	MDL4000, Opto FW	USB-HID	12	A-A	MDL400U1-SK1	MEKminiUSB
MDL400U1-02	MDL4000, OSE FW	USB-HID	12	A-A	MDL400U1-SK2	MEKminiUSB
MDL400U1-01	MDL4000, Opto FW	USB-COM	12	A-A	MDL400U1-SK1	MEKminiUSB
MDL400U1-02	MDL4000, OSE FW	USB-COM	12	A-A	MDL400U1-SK2	MEKminiUSB
MDL100R1-01	MDL1000, OSE FW	RS232	12	A-A	MDL100R1-SK2	MEKmini2
MDL2001R1-00	MDL2001, OSE FW	RS232	12	A-A	MDL2001R1-SK2	MEKmini2

Imager Modules:



Opticon Part # For Module only	Model / Description	Interface	Range*	FFC pins	FFC Type	Order Part # for MEK EVAL Board	MEK board used
MDI1000-00	MDI1000, Opto FW	RS232	SR	30	A-A	MDI1000R1-SK1	MEK1001
MDI1000U2-00	MDI1000, Opto FW	USB-COM	SR	30	A-A	MDI1000U2-SK1	MEK1001
MDI2300-00	MDI2300, Opto FW	RS232	AF	17	A-A	MDI2300R1-SK1	MEK1001
MDI2300U2-00	MDI2300, Opto FW	USB-COM	AF	17	A-A	MDI2300U2-SK1	MEK1001
MDI2350-00	MDI2350, Opto FW	RS232	SR	17	A-A	MDI2350R1-SK1	MEK1001
MDI2350U2-00	MDI2350, Opto FW	RS232	SR	17	A-A	MDI2350U2-SK1	MEK1001
MDI3000SRR1-00	MDI3000, Opto FW	RS232	SR	12	A-A	MDI3000SRR1-SK2	MEKmini2
MDI3000SRU2-00	MDI3000, Opto FW	USB-COM	SR	12	A-A	MDI3000SRU2-SK2	MEKmini2
MDI3100SRR1-00	MDI3100, Opto FW	RS232	SR	12	A-B	MDI3100SRR1-SK2	MEKmini2
MDI3100HDR1-00	MDI3100, Opto FW	RS232	HD	12	A-B	MDI3100HDR1-SK2	MEKmini2
MDI3100SRU1-00	MDI3100, Opto FW	USB-HID	SR	12	A-B	MDI3100SRU1-SK2	MEKmini2
MDI3100HDU1-00	MDI3100, Opto FW	USB-HID	HD	12	A-B	MDI3100HDU1-SK2	MEKmini2
MDI3100SRU2-00	MDI3100, Opto FW	USB-COM	SR	12	A-B	MDI3100SRU2-SK2	MEKmini2
MDI3100HDU2-00	MDI3100, Opto FW	USB-COM	HD	12	A-B	MDI3100HDU2-SK2	MEKmini2
MDI3200SRR1-00	MDI3200, Opto FW	RS232	SR	12	A-A	MDI3200SRR1-SK2	MEKmini2
MDI3300SRR1-00	MDI3300, Opto FW	RS232	SR	12	A-B	MDI3300SRR1-SK2	MEKmini2
MDI3300SRU1-00	MDI3300, Opto FW	USB-HID	SR	12	A-B	MDI3300SRU1-SK2	MEKmini2
MDI3300SRU2-00	MDI3300, Opto FW	USB-COM	SR	12	A-B	MDI3300SRU2-SK2	MEKmini2
MDI4000SRR1-00	MDI4000, Opto FW	RS232	SR	12	A-B	MDI4000SRR1-SK2	MEKmini2
MDI4000HDR1-00	MDI4000, Opto FW	RS232	HD	12	A-B	MDI4000HDR1-SK2	MEKmini2
MDI4000UDR1-00	MDI4000, Opto FW	RS232	UD	12	A-B	MDI4000UDR1-SK2	MEKmini2
MDI4100SRR1-00	MDI4100, Opto FW	RS232	SR	12	A-B	MDI4100SRR1-SK2	MEKmini2
MDI4100HDR1-00	MDI4100, Opto FW	RS232	HD	12	A-B	MDI4100HDR1-SK2	MEKmini2
MDI4100UDR1-00	MDI4100, Opto FW	RS232	UD	12	A-B	MDI4100UDR1-SK2	MEKmini2
MDI5010MRR1-00	MDI5010, Opto FW	RS232	MR	12	A-B	MDI5010MRR1-SK2	MEKmini2
MDI5010MRU1-00	MDI5010, Opto FW	USB-HID	MR	12	A-B	MDI5010MRU1-SK2	MEKmini2
MDI5010MRU2-00	MDI5010, Opto FW	USB-COM	MR	12	A-B	MDI5010MRU2-SK2	MEKmini2

*Range: {UD = Ultra Density (very close range); HD = High Density (close range); SR= Standard Range, MR = Mid-Range; AF = Auto Focus (variable range)}

Section 2: Eval Kits: MEK 1001 Combo Board & -(SK1)



The MEK 1001 board was designed as a multi-module combination board. This evaluation board contains four (4) different pin-out connectors to connect to most of the different module families. The picture to the left, shows a MEK 1001 board mounted on a black 'Z' bracket & a MDI2000 module is attached.

The
the



MEK1001 Board (08-ENG07-01)

MEK1001 board assembly by itself (shown to the right) is
OpticonUSA: Part #: 08-ENG07-01

Module Evaluation Kits: There are several kits that are offered with the MEK1001 board that is useful in evaluating a scan module. They are listed in the table below:

Opticon Inc. Part #	Description	Includes Module #	Includes FFC #	FFC cond., length.
MDL1000R1-SK1	KIT, STARTER, MDL1000, RS232	MDL1000R1-01	41-MODL003F-01	12pin, 100mm
MDL2001R1-SK1	KIT, STARTER, MDL2001, RS232	MDL2001R1-00	41-MODL003F-01	12pin, 100mm
MDL4000R1-SK1	KIT, STARTER, MDL4000, RS232	MDL4000R1-01	41-MODL003F-01	12pin, 100mm
MDI1000R1-SK1	KIT, STARTER, MDI1000, RS232	MDI1000-00	41-MODL010F-01	30pin, 45mm
MDI1000U2-SK1	KIT, STARTER, MDI1000, USBCOM	MDI1000-00	41-MODL010F-01	30pin, 45mm
MDI2300R1-SK1	KIT, STARTER, MDI2300, RS232	MDI2300-00	41-MODL009F-01	17pin, 69mm
MDI2300U2-SK1	KIT, STARTER, MDI2300, USBCOM	MDI2300-00	41-MODL009F-01	17pin, 69mm
MDI2350R1-SK1	KIT, STARTER, MDI2350, RS232	MDI2350-00	41-MODL009F-01	17pin, 69mm
MDI2350U2-SK1	KIT, STARTER, MDI2350, USBCOM	MDI2350-00	41-MODL009F-01	17pin, 69mm
MDI3000SRR1-SK1	KIT, STARTER, MDI3000, RS232	MDI3000SRR1-00	41-MODL015F-01	12pin, 50mm
MDI3100SRR1-SK1	KIT, STARTER, MDI3100, RS232	MDI3100SRR1-00	41-MODL015F-01	12pin, 50mm

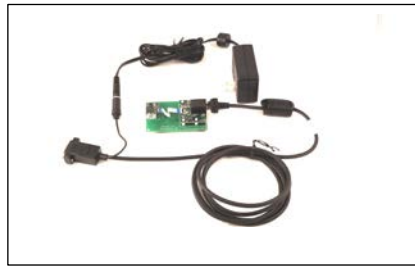
R1 = RS232, U1 = USB-HID MODE, U2 = USB-COM MODE

Plus, each Kit contains the following common items:

08-ENG07-01	MEK-1001 w/30,14,17,12 pin { PCB Assembled}
18-MEKZMNT-01	MEK 'Z' MOUNTING BRACKET
32-00535-03	If RS232 version: PWR SUPPLY, 5VDC, BARREL,4X1.7MM
41-MISC007S-01	If RS232 version: RS232 Cable for MEK to PC Host
41-MISC008S-01	If USB version: USB Cable for MEK to PC Host

Section 3: Typical Eval Kit: MEKmini2 (-SK2)

The MEKmini2 boards are now used commonly for most “module evaluation kits” (MEK). These boards and the module of choice are then mounted on a small green MEK base board. Below shows a few pictures of the evaluation kits. Only modules with a 12 pin connector can be used with these kits (Except for the MDL4000 modules).



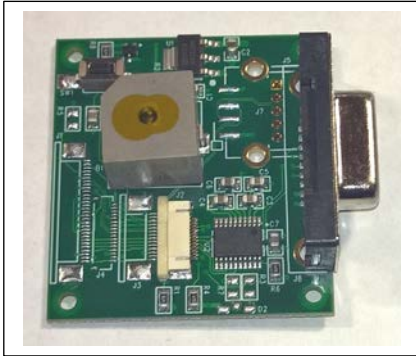
MEKmini2 Module Evaluation Kits:

Eval. Kit #	Description	Type	Interface Mode	Includes Module #	Includes FFC # (Type)
MDI3000SRR1-SK2	KIT, STARTER, MDI3000, SR	Imager, 2D	RS232	MDI3000SRR1-00	41-MODL015F-01 (A-A)
MDI3000SRU2-SK2	KIT, STARTER, MDI3000, SR	Imager, 2D	USB-COM	MDI3000SRU2-00	41-MODL015F-01 (A-A)
MDI3100SRR1-SK2	KIT, STARTER, MDI3100, SR	Imager, 2D	RS232	MDI3100SRR1-00	41-MODL016F-01 (A-B)
MDI3100HDR1-SK2	KIT, STARTER, MDI3100, HD	Imager, 2D	RS232	MDI3100HDR1-00	41-MODL016F-01 (A-B)
MDI3100SRU1-SK2	KIT, STARTER, MDI3100, SR	Imager, 2D	USB-HID	MDI3100SRU1-00	41-MODL016F-01 (A-B)
MDI3100HDU1-SK2	KIT, STARTER, MDI3100, HD	Imager, 2D	USB-HID	MDI3100HDU1-00	41-MODL016F-01 (A-B)
MDI3100SRU2-SK2	KIT, STARTER, MDI3100, SR	Imager, 2D	USB-COM	MDI3100SRU2-00	41-MODL016F-01 (A-B)
MDI3100HDU2-SK2	KIT, STARTER, MDI3100, HD	Imager, 2D	USB-COM	MDI3100HDU2-00	41-MODL016F-01 (A-B)
MDI3200SRR1-SK2	KIT, STARTER, MDI3200, SR	Imager, 2D	RS232	MDI3200SRR1-00	41-MODL015F-01 (A-A)
MDI3300SRR1-SK2	KIT, STARTER, MDI3300, SR	Imager, 2D	RS232	MDI3300SRR1-00	41-MODL016F-01 (A-B)
MDI3300SRU1-SK2	KIT, STARTER, MDI3300, SR	Imager, 2D	USB-HID	MDI3300SRU1-00	41-MODL016F-01 (A-B)
MDI3300SRU2-SK2	KIT, STARTER, MDI3300, SR	Imager, 2D	USB-COM	MDI3300SRU2-00	41-MODL016F-01 (A-B)
MDI4000SRR1-SK2	KIT, STARTER, MDI4000, SR	Imager, 2D	RS232	MDI4000SRR1-00	41-MODL016F-01 (A-B)
MDI4000HDR1-SK2	KIT, STARTER, MDI4000, HD	Imager, 2D	RS232	MDI4000HDR1-00	41-MODL016F-01 (A-B)
MDI4000UDR1-SK2	KIT, STARTER, MDI4000, UD	Imager, 2D	RS232	MDI4000UDR1-00	41-MODL016F-01 (A-B)
MDI4100SRR1-SK2	KIT, STARTER, MDI4100, SR	Imager, 2D	RS232	MDI4100SRR1-00	41-MODL016F-01 (A-B)
MDI4100HDR1-SK2	KIT, STARTER, MDI4100, HD	Imager, 2D	RS232	MDI4100HDR1-00	41-MODL016F-01 (A-B)
MDI4100UDR1-SK2	KIT, STARTER, MDI4100, UD	Imager, 2D	RS232	MDI4100UDR1-00	41-MODL016F-01 (A-B)
MDL1000R1-SK2	KIT, STARTER, MDL1000, SR	Laser, 1D	RS232	MDL1000R1-01	41-MODL015F-01 (A-A)
MDL2001R1-SK2	KIT, STARTER, MDL2001, SR	Laser, 1D	RS232	MDL2001R1-00	41-MODL015F-01 (A-A)
MDC100R1-SK2	KIT, STARTER, MDC100, SR	CCD, 1D	RS232	MDC100R1-00	41-MODL015F-01 (A-A)
MDC100U1-SK2	KIT, STARTER, MDC100, SR	CCD, 1D	USB-HID	MDC100U1-00	41-MODL015F-01 (A-A)
MDC100U2-00	KIT, STARTER, MDC100, SR	CCD, 1D	USB-COM	MDC100U2-00	41-MODL015F-01 (A-A)
MDC200R1-00	KIT, STARTER, MDC200, SR	CCD, 1D	RS232	MDC200R1-00	41-MODL015F-01 (A-A)
MDC200U1-00	KIT, STARTER, MDC200, SR	CCD, 1D	USB-HID	MDC200U1-00	41-MODL015F-01 (A-A)
MDC200U2-00	KIT, STARTER, MDC200, SR	CCD, 1D	USB-COM	MDC200U2-00	41-MODL015F-01 (A-A)

Each MEKmini2 Eval. Kit contains the following common parts:

08-MEKmini2-RJ50-00	MEK mini#2 PCB { PCB Assembled}
40-MEKbase1-00	MEK base mounting board
18-BMPR001-01	Rubber bumper feet - (4) used
18-STOF002-01	1/2" white plastic standoffs - (4) used
18-SCRW021-01	M2 screws for mounting the module - (2) used
41-MODL015F-01	Either: FFC Cable, L=50mm (Type A-A – same side contacts) MEK to Module connection
41-MODL016F-01	or: FFC Cable, L=50mm (Type A-B – opposite side contacts) MEK to Module connection
41-MISC007S-01	If RS232 Version: RS232 Cable for MEK to PC Host
32-00535-03	If RS232 Version: PWR SUPPLY, 5VDC, BARREL, 4X1.7MM (if RS232 mode)
41-MISC008S-01	If USB Version: USB Cable for MEK to PC Host (If USB Mode)
Module of choice	

Section 4: MEKmini PC board Assembly



The MEKmini board was designed as an option loaded combination board. It may be used for evaluations or it may be purchased by a customer for use along with a module for a complete OEM solution. This board allows for various combinations of circuitry to connect to most of the different module types and can include only the circuitry necessary. For instance, if the module does not need to sound the beeper tone, since the host computer will do this, then the buzzer circuitry may not be needed.

There are several kits that are offered with the MEKmini board. Some are standard (in-stock) and others may require a lead time and a minimum order quantity.

NOTE: THIS BOARD DOES NOT COME WITH A CABLE. FOR RS232 TYPE CONFIGURATION, THE CUSTOMER MUST SUPPLY A CABLE THAT HAS A 9-PIN MALE SUB-D CONNECTOR ON IT. FOR POWER TO THE BOARD, 5-VOLTS MUST BE SUPPLIED ON PIN #9. FOR THE USB CONFIGURATION, A STANDARD OFF-THE-SHELF USB TYPE-A TO USB-MINI TYPE B MAY BE USED.

Current MEKmini Assemblies:

Opticon Inc. Part #	Supported Modules:	FFC Pins	Interface Type	Has Buzzer	Has Trigger	GDRD LED
08-MEKmini-30-DB9-BUZ-TRG-00	MDI1000	30	RS232 – DB9	YES	YES	NO
08-MEKmini-30-DB9-BUZ-TRG-K01	MDI1000, incl. 30pin FFC cable 76mm	30	RS232 – DB9	YES	YES	NO
08-MEKmini-12-DB9-BUZ-TRG-00	All 12-pin modules in RS232 mode	12	RS232 – DB9	YES	YES	NO
08-MEKmini-17-DB9-00	MDI2300, MDI2350	17	RS232 – DB9	NO	NO	NO
08-MEKmini-17-DB9-BUZ-TRG-00	MDI2300, MDI2350	17	RS232 – DB9	YES	YES	NO
08-MEKmini-17-USBA-BUZ-TRG-00	MDI2300, MDI2350	17	USB-Mini	YES	YES	NO

Section 5: MEKmini2 PC board Assembly





The MEKmini2 boards are the 2nd generation of the original “MEKmini” board. This board was designed specifically for all of the 12-pin type module products (except for the MDL4000). It may be used for evaluations or it may be purchased by a customer for use along with a module for a complete OEM solution.

These boards include a trigger button and a sound buzzer. There are a few versions of this board that are in stock as a standard part number. Some may require a longer lead time and a minimum order quantity.

These interface boards provide the following functions:

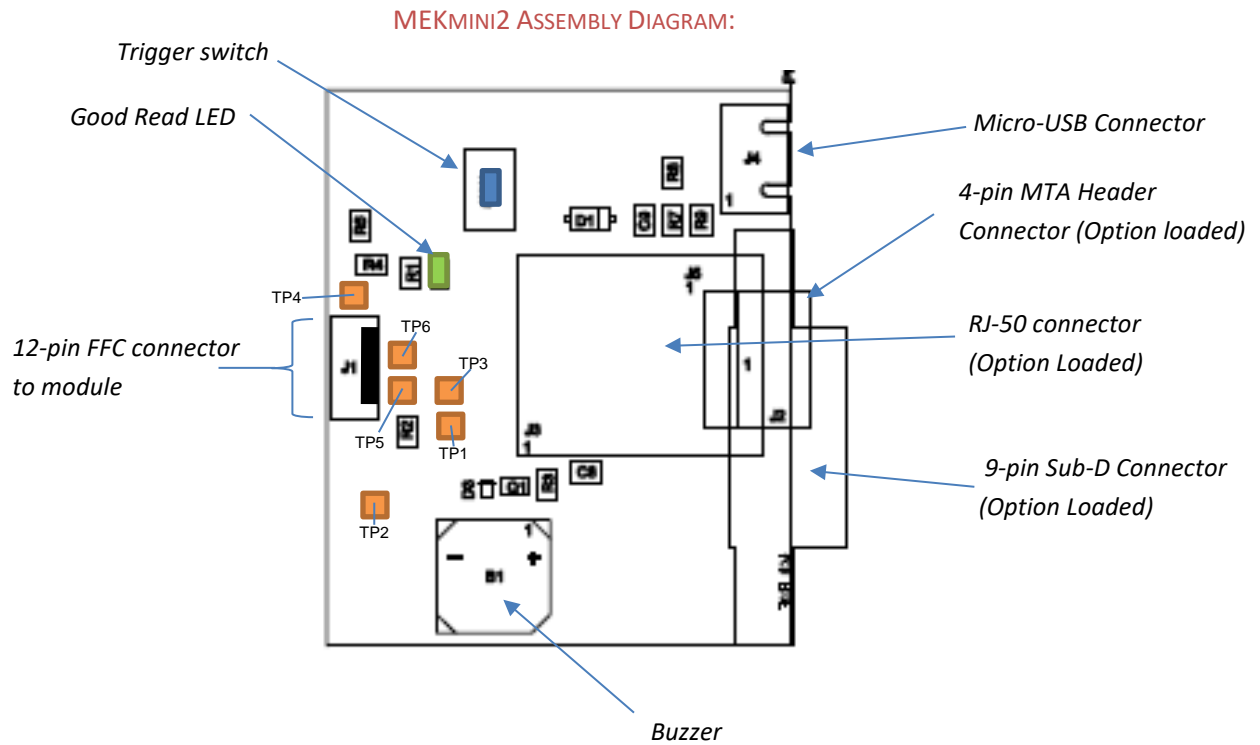
- 5V to 3.3V conversion
- Trigger switch. Used for test purposes.
- Good Read LED
- Buzzer
- Conversion from TTL RS232 to true RS232C interface
- Micro USB connector for simple off-the-shelf USB cable connection
- Multiple host connectors: RJ50 (standard option) or [DB9-F or 4-pin Header] (special options) connectors
- 12 pin FFC connector for modules (conductors on both top and bottom).

MEKmini2 PC Board Assembly only:

Opticon Inc. Part #	Picture	Host Connector(s)	Interface	Details
08-MEKmini2-DB9-01		DB9 + microUSB	RS232 or USB	This requires a RS232 COM port cable with a 'Male' DB9 pin connector. +5V Power must be connected to pin 9 to operate properly.
08-MEKmini2-RJ50-01		RJ50 + microUSB – can do RS232 or USB –	RS232 or USB via RJ50 cable + USB via MicroUSB cable	The RS232 cable requires a +5V power supply. Requires MEK cable: 41-MISC007S-01 for RS232, or, 41-USB008S-01 for USB.
08-MEKmini2-HDR-01	No Picture	4- pin, Right Angle, MTA type Header, 0.1" centers.	RS232 only	This option uses a 4-pin, right-angle, 0.1" pitch, MTA type, connector for the host connection. The signals are (+5V, TxD, RxD, & GND). The connector on the board is part number: 640455-4 and will need the matching MTA connector.

NOTE: THESE BOARDS DO NOT COME WITH A HOST CABLE. ORDER THOSE SEPARATELY OR ORDER AS AN EVALUATION KIT

MEKMINI2 – ASSEMBLY DIAGRAM



Testpoint	Label	I/O	Function
TP1	Download	Input	Set Low & Power up to force module into download mode (Short pins TP1 to TP2 temporarily while powering up and then remove short)
TP2	Ground		Common Ground signal
TP3	TxD	Output	Transmitted Data (From Module)
TP4	RTS	Output	Ready to Send (Module has Data to send)
TP5	RxD	Input	Received Data (From Host)
TP6	CTS	Input	Clear to Send (Host is ready to accept data)

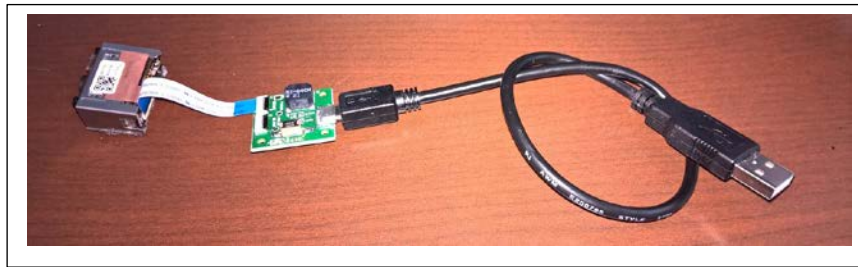
Section 6: MEKminiUSB



The MEKminiUSB board was designed for modules that have a 12-pin FFC connector and will operate in USB modes only. It is designed to have minimal parts and is very small (apx. 1" square). This is perfect for OEM customers who need a module size, but do not want to design their own interface board.

This evaluation board contains two (2) different pin-out connectors to connect to two different styles of USB-mode pinouts (one is for the MDL4000 USB module, the other is for the {MDI3x00, MDI4x00, MDC} family of modules).

The picture (above-left), shows a MEKminiUSB board mounted on a black 'Z' bracket & a MDL4000 module is attached. The picture below, shows a MEKminiUSB board connected to a module and the USB-A to Micro-B cable connected.



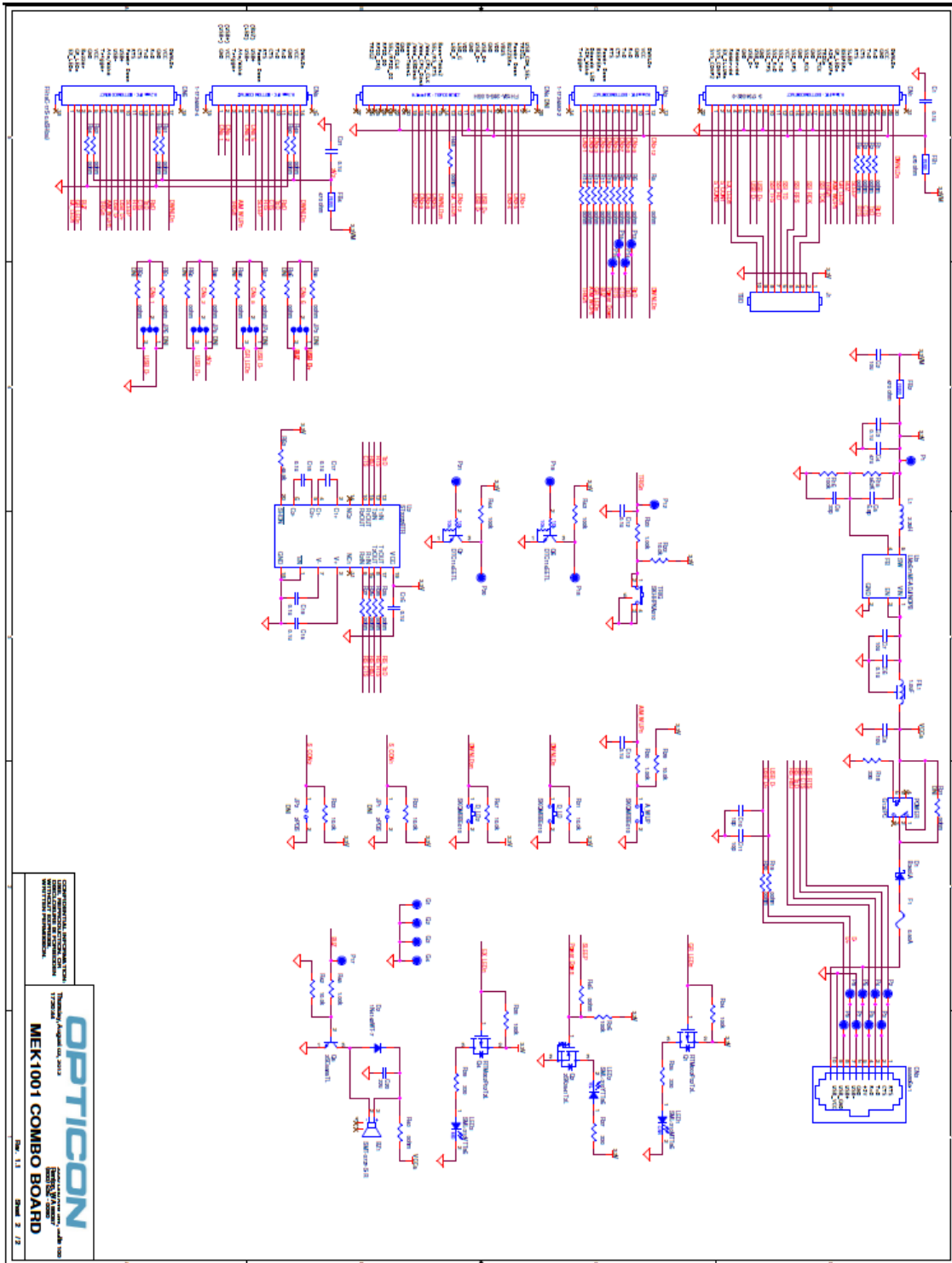
Order for MEKminiUSB Assembly (board only)

Opticon Inc. Part #	Support Modules:
08-MEKminiUSB-02	<p>Connector Marked 'MDL4000': MDL4000 [in USB-HID Mode or USB-COM mode]</p> <p>Connector Marked 'MDI3x00': MDI13000, MDI3100, MDI3200, MDI3300, MDC100, MDC200, MDI4000, MDI4100 [in USB-HID Mode or USB-COM mode]</p>

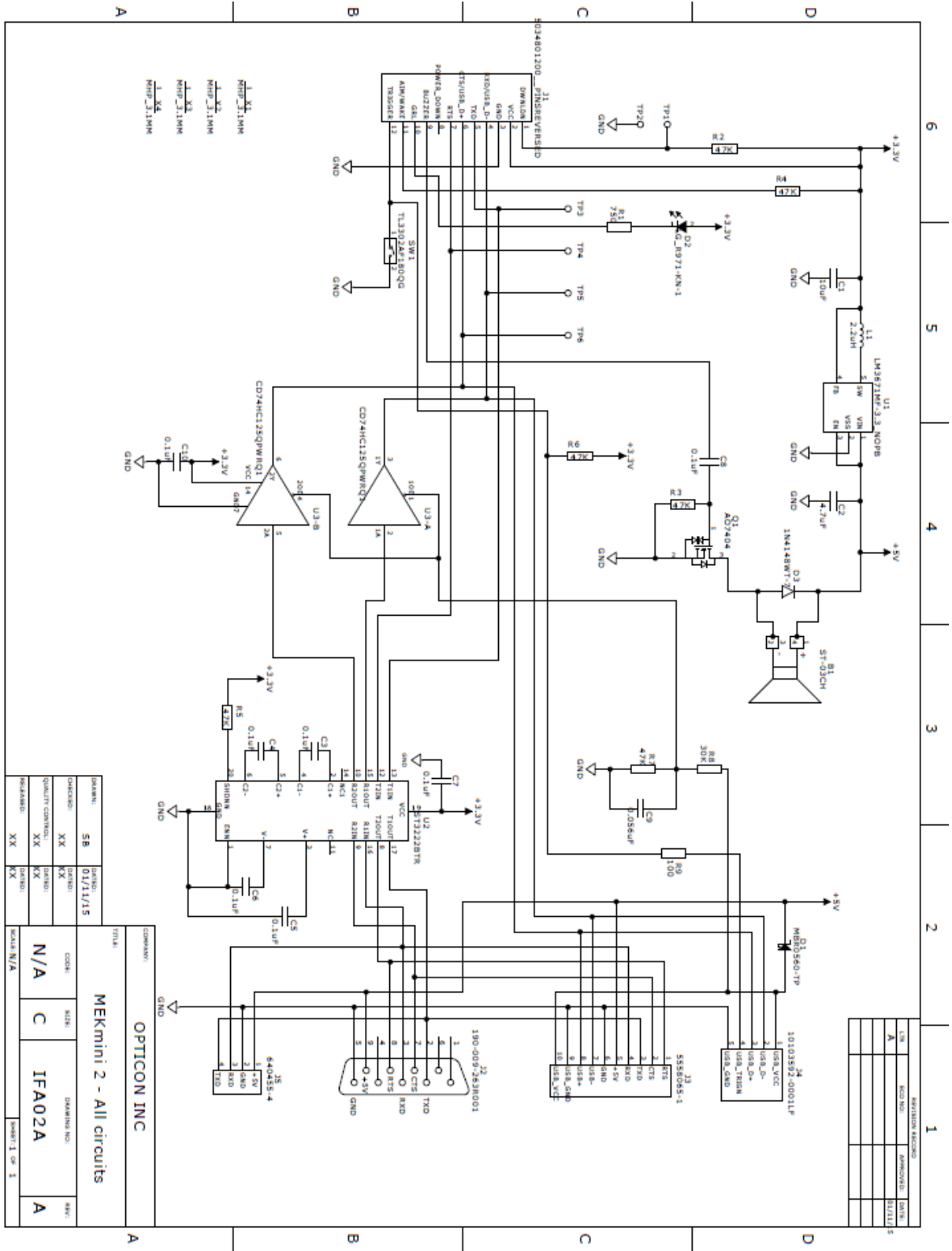
Optional Parts for a MEKminiUSB Assembly:

Opticon Inc. Part #	Description
41-USB009S-01	Cable, USB-A to Micro-B USB, 1 meter
41-MODL015F-01	FFC, 50mm length (Type A-A, same side contacts)
41-MODL016F-01	FFC, 50mm length (Type A-B, opposite side contacts)
18-MEKZMNT-01	MEK 'Z' MOUNTING BRACKET

APPENDIX A: MEK1001 Board Schematic



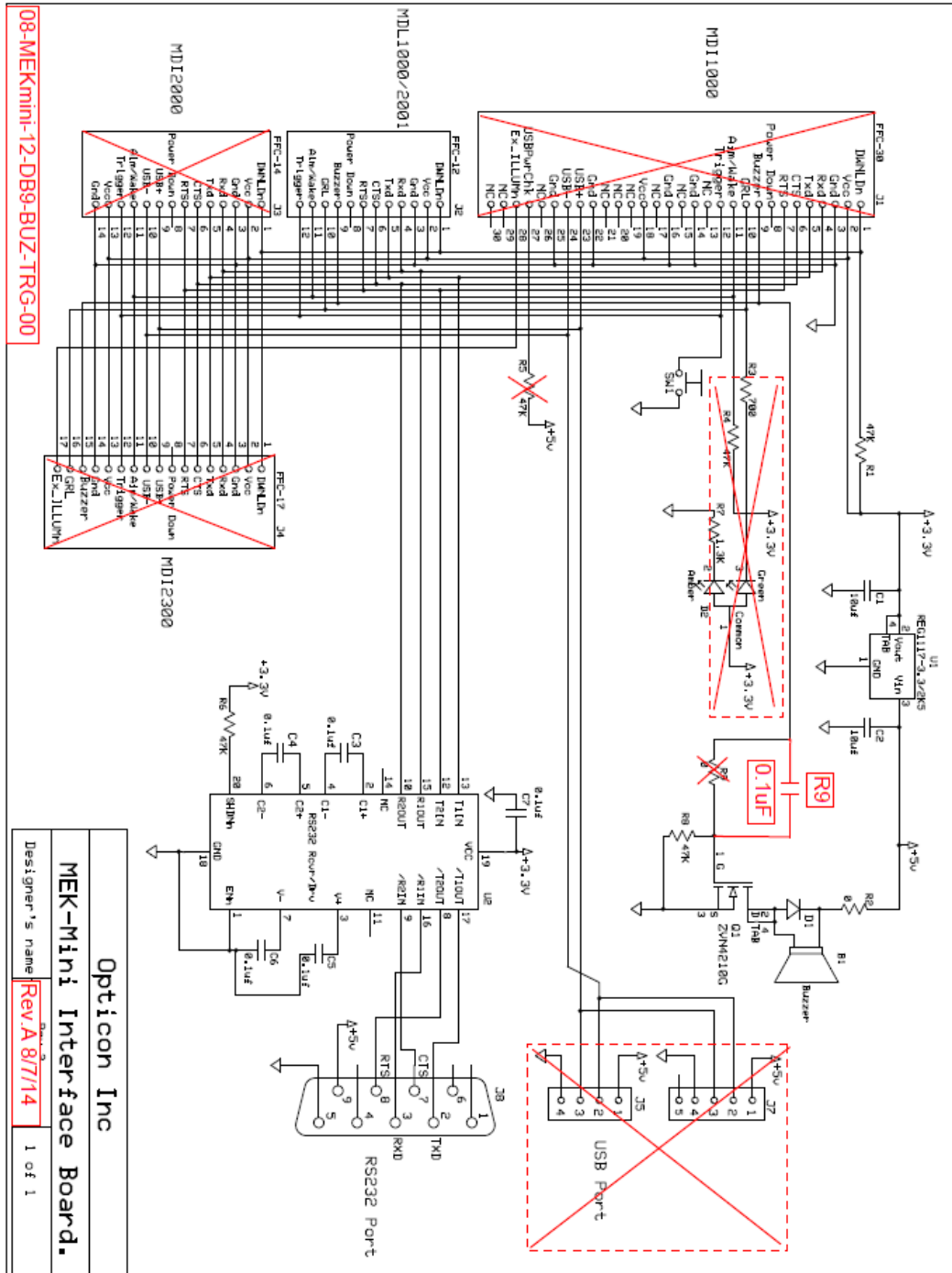
APPENDIX B: MEKmini Board Schematic



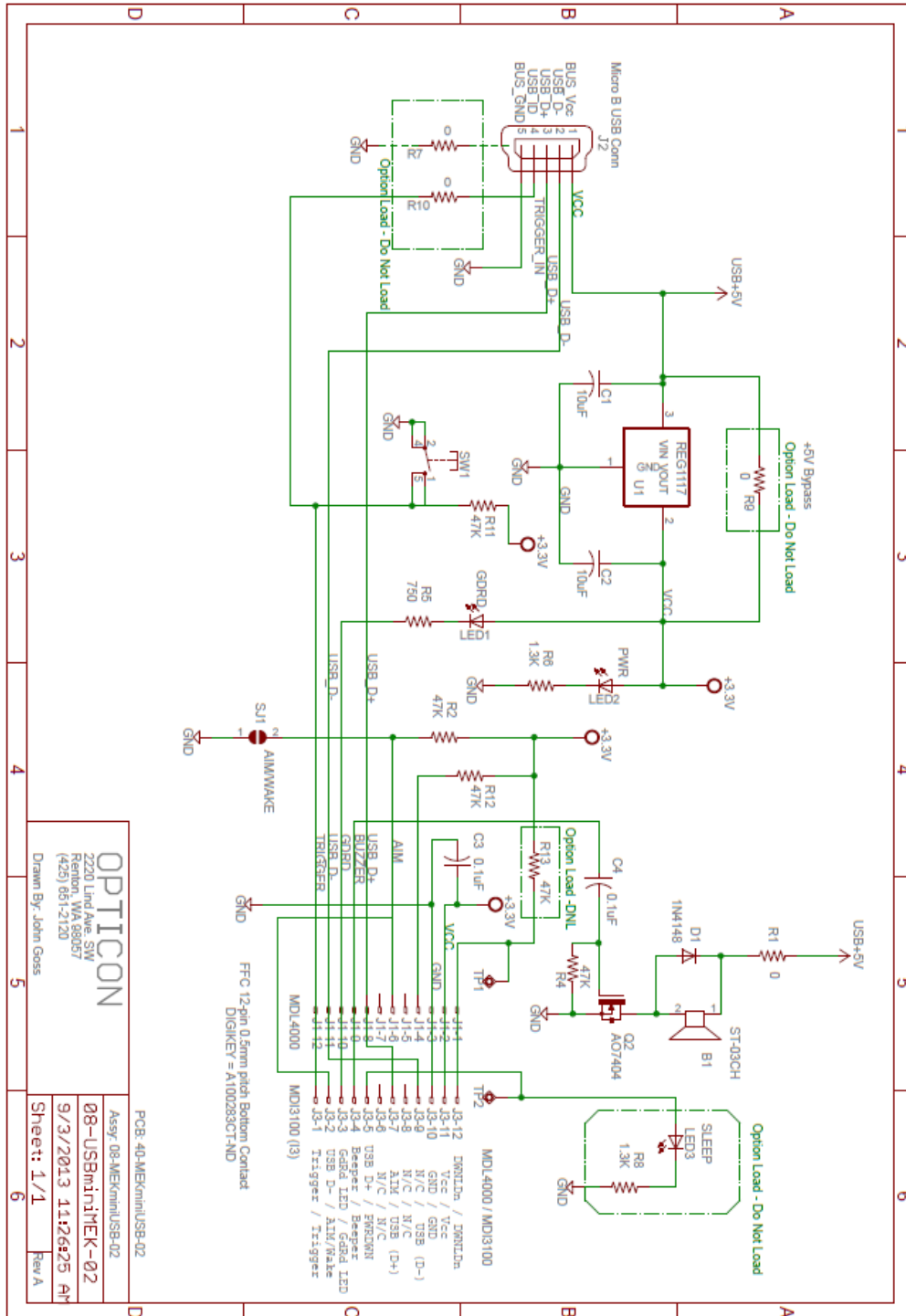
DESIGNED BY	5B	DESIGNED DATE	01/11/15
CHECKED BY	XX	CHECKED DATE	XX
QUALITY CONTROL	XX	QUALITY CONTROL DATE	XX
REWORKED BY	XX	REWORKED DATE	XX
TITLE		MEKmini 2 - All circuits	
COMPANY		OPTICON INC	
CODE	SIZE	DRAWING NO.	REV.
N/A	C	IFA02A	A
SCALE		SHEET 1 OF 1	

APPENDIX C: 08-MEKmini-12-DB9-BUZ-TRG-00 Board Schematic

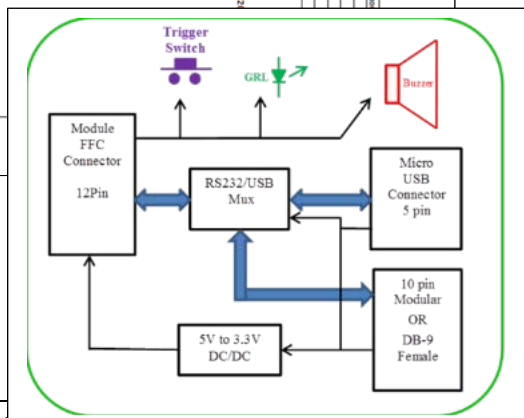
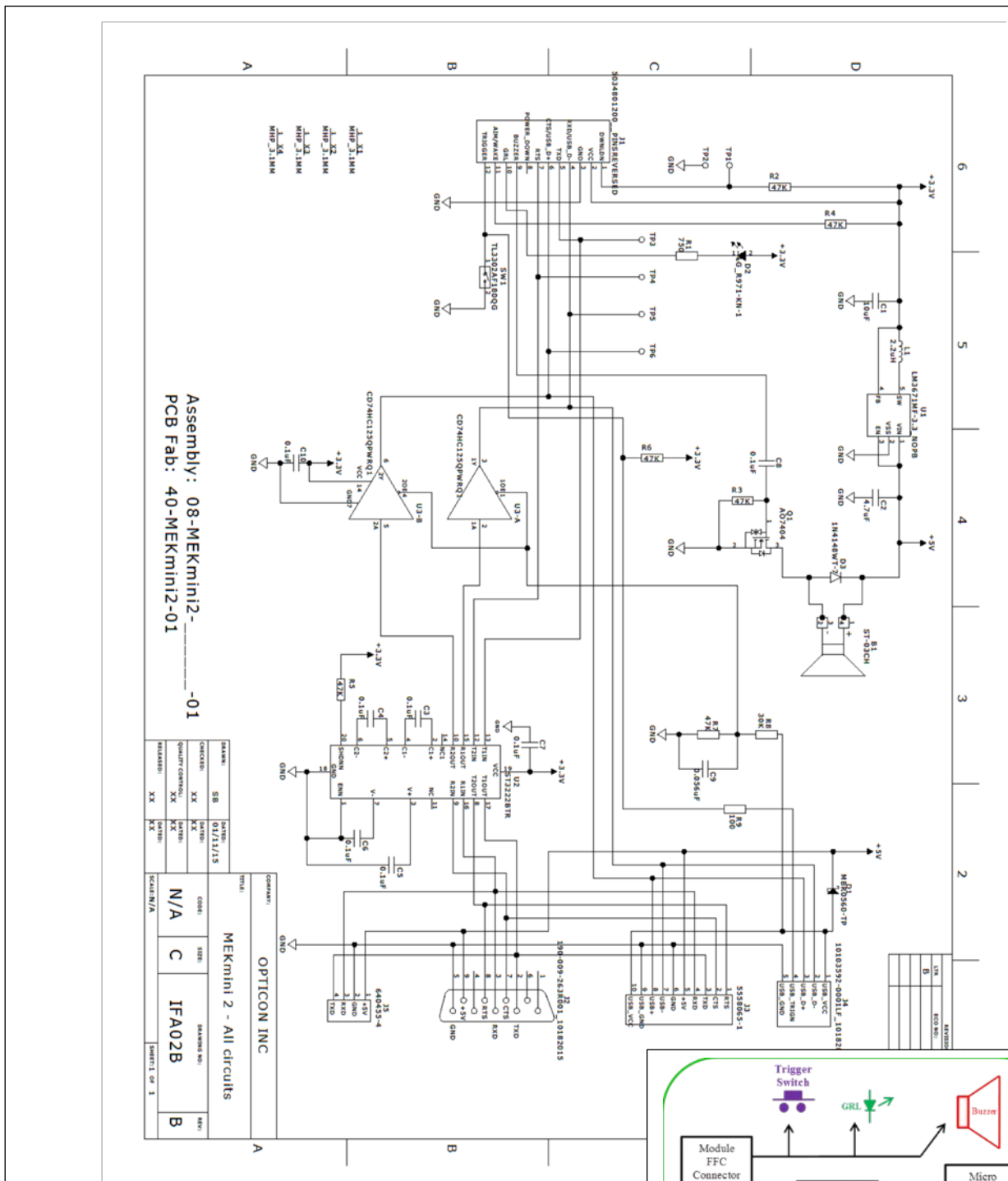
This is the schematic for the 08-MEKmini-12-DB9-BUZ-TRG-00. It shows all the components contained in the full MEKmini schematic (See Appendix B) and the components that are not required are crossed out, leaving the 12-Pin FFC connector, the DB-9 connector, the Buzzer & circuitry, the Trigger button, and the necessary power regulator circuitry.



APPENDIX D: MEKminiUSB Board Schematic



APPENDIX E: MEKmini2 Board Schematic



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