

Instruction Manual	
Evaluation Kit for MDL and MDI Series Scan Engines	
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Initial	2011/7/15	---	(Initial Release)

Note:

This instruction manual provides safety and operating instructions for the MEK-1001. Please read these instructions carefully before operating this device.

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Safety Cautions

This instruction manual includes the following symbols and markings to help you use this device properly and safely. Symbols and their significance are as follows:

Safety Descriptions


This instruction manual includes the symbols and markings like the ones below to help you use this device properly and safely. Symbols and their significance are as follows:

	An exclamation point inside an equilateral triangle indicates important operating and maintenance instructions.
	A circle with a line through it indicates something you should not do. Do not tamper with devices marked with this symbol, or you may void the warranty or cause injury.






Safety Instructions

Review the following safety precautions for safe operation of the MEK-1001:

Danger

	Do not use this device near flammable substances (such as gas and explosives).
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Warning

	Do not throw this device into a fire. Doing so may cause the battery case to burst, resulting in injury or possibly acting as an accelerant for the fire.
	Do not insert foreign substances into the device. Doing so may short-circuit or overheat the battery, resulting in fire or electric shock.
	Do not dismantle or modify this device.
	Do not use this device in the following areas. Doing so may cause fire, electric shock, malfunction, or radio interference: <ul style="list-style-type: none"> • In areas exposed to direct sunlight for long periods of time • Near water or in extremely high humidity • Near heat sources, such as radiators, heat registers, stoves, or other types of apparatus that produce heat • Near microwaves, medical devices, or low-power radio stations
	Do not use this device while it is connected to medical equipment or safety devices designed to protect the human body. This device may produce radio interference that would interfere with the normal operation of such equipment, resulting in injury or equipment damage.

Caution


	Do not drop the unit or set it on an unstable surface from which it could fall.
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1. Abstract

This instruction manual provides safety and operating instructions for the MEK-1001 interface circuit board.

2. Overview

The MEK-1001 is an interface circuit board which can be used for all Opticon series scan engines. Its main functions are to start up the scan engine and to confirm the communication signals. The MEK-1001 communicates via RS-232C or USB. The MEK-1001 complies with RoHS.

3. Hardware Structure

The MEK-1001 consists of a power switch, trigger key, 10-pin modular jack, four individual scan engine connectors, a buzzer, three LEDs, a fuse, a 3.3-V power supply section and a RS-232C driver.

4. Interface Specifications

4-1. Interface Signal

Table 1: CN_3 RJ45 10-pin Modular Jack Signals

No.	Signal			Note
	Name	Function	I/O	
1	RTS	Comm. control signal to the host.	Out	Data output request to the host.
2	CTS	Comm. control signal from the host.	In	Data output request from the host.
3	TxD	Data transmission signal.	Out	Asynchronous data transmission to the host.
4	RxD	Data reception signal.	In	Asynchronous data transmission from the host.
5	V _{CC}	Power supply input of 5V.	In	
6	GND	System ground	-	
7	USB -	-	In/Out	USB 1.1
8	USB +	-	In/Out	
9	GND	System ground		
10	-	-	-	

Table 2: CN_1 30-pin Connector Signals for MDI-1000 series
(Opposite pin assignments from the ones of scan engines.)

No.	Signal			Control	Notes
	Name	Function	I/O		
1	Reserved		Out		Not connected
2	Reserved		Out		Not connected
3	EX_ILLUMn	EX LED signal	In	L: External light ON H: External light OFF	Controls the external light source.
4	USB_Vcc5	USB power output	Out		USB bus power monitor
5	Reserved		Out		
6	GND	System ground			
7	USB-		In/Out		USB 1.1
8	USB+		In/Out		
9	GND	System ground			
10	Reserved		In		Not connected
11	Reserved		Out		Not connected
12	Reserved		In		Not connected
13	Vcc	3.3V-power supply output	Out		Not connected
14	Reserved		Out		Not connected
15	GND	System ground			
16	Reserved		Out		Not connected
17	GND	System ground			
18	Reserved		In		Not connected
19	TRIGn	Start operation signal	Out	L: Start operation H: No action	Command to start capturing images or to start decoding
20	AIM/WUPn	(When in power down mode) Recovery signal from the power down state	Out	L: Recovery from the power down state H: No action	
		(When not in power down mode) Aiming control signal	Out	L: Aiming LED ON H: Aiming LED OFF	
21	GR_LEDn	Notifies successful scanning	In	L: LED ON H: LED OFF	
22	BUZZER	Buzzer sounding signal	In	L: Buzzer OFF PWM: Buzzer ON	PWM signal controls the tone and the loudness of buzzer
23	POWER DOWN	Notifies power down state of the scan engine	In	L: Normal state H: Power down state	
24	RTS	Comm. Control signal to the host	In		Data output request from the scan engine
25	CTS	Comm. Control signal from the host	Out		Data output request to the scan engine
26	T \square D	Data reception signal	In		Asynchronous data transmission to the host.
27	R \square D	Data transmission signal	Out		Asynchronous data transmission from the host.
28	GND	System ground			
29	Vcc	3.3V-power supply output	Out		
30	DWNLDn	Maintenance mode control signal	Out	L: Maintenance mode H: Non-operating status	Check the signal upon the power supply and enable to re-write on the software.

Note: Signal names are the same with the signal names of MDI scan engines.

Table 3: CN_6 17-pin Connector Signals for MDI-23XX series

(Opposite pin assignments from the ones of scan engines.)

No.	Signal			Control	Notes
	Name	Function	I/O		
1	EX_ILLUMn	EX LED signal	In	L: External light ON H: External light OFF	Controls the external light source.
2	GR LEDn	Notifies successful scanning	In	L: LED ON H: LED OFF	
3	BUZZER	Buzzer sounding signal	In	L: Buzzer OFF PWM: Buzzer ON	PWM signal controls the tone and the loudness of buzzer
4	GND	System ground			
5	Vcc	3.3V-power supply output	Out		
6	TRIGn	Start operation signal	Out	L: Start operation H: No action	Command to start capturing images or to start decoding
7	AIM/WUPn	(When in power down mode) Recover signal from the power down state	Out	L: Recovery from the power down state H: No action	
		(When not in power down mode) Aiming control signal	Out	L: Aiming LED ON H: Aiming LED OFF	
8	USB-		In/Out		USB 1.1
9	USB+		In/Out		
10	POWERDWN	Notifies power down state of the scan engine	In	L: Normal state H: Power down state	
11	RTS	Comm. Control Signal to the host	In		Data output request from the scan engine
12	CTS	Comm. Control signal to the host	In		Data output request from the scan engine
13	TxD	Data reception signal	In		Asynchronous data transmission to the host
14	RxD	Data transmission signal	Out		Asynchronous data transmission to the host.
15	GND	System ground			
16	Vcc	3.3V-power supply output	Out		
17	DWNLDn	Download control signal	Out	L: Maintenance mode H: Non-operating status	Check the signal upon the power supply and enable the re-write on the software.

Note: Signal names are the same with the signal names of MDI scan engines.

Table 4: CN_5 14-pin Connector Signals for MDI-2000 series
(Opposite pin assignments from the ones of scan engines.)

No.	Signal			Control	Notes
	Name	Function	I/O		
1	GND	System ground			
2	Vcc	3.3V-power supply output	Out		Not connected
3	TRIGn	Start operation signal	Out	L: Start operation H: No action	Command to start capturing images or to start decoding
4	AIM/WUPn	(When in power down mode) Recovery signal from the power down state	Out	L: Recovery from the power down state H: No action	
		(When not in power down mode) Aiming control signal	Out	L: Aiming LED ON H: Aiming LED OFF	
5	USB-		In/Out		USB 1.1
6	USB+		In/Out		
7	POWERDWN	Notifies power down state of the scan engine	In	L: Normal state H: Power down state	
8	RTS	Comm. Control signal to the host	In		Data output request from the scan engine
9	CTS	Comm. Control signal from the host	Out		Data output request to the scan engine
10	TxD	Data reception signal	In		Asynchronous data transmission to the host
11	RxD	Data transmission signal	Out		Asynchronous data transmission from the host.
12	GND	System ground			
13	V _{CC}	3.3V-power supply output	Out		
14	DWNLDn	Maintenance mode control signal	Out	L: Maintenance mode H: Non-operating status	Check the signal upon the power supply and enable to re-write on the software.

Note: Signal names are the same with the signal names of MDI scan engines.

Table 5: CN_2 12-pin Connector Signals for MDL-1000 and MDL-2000 series

(Opposite pin assignments from the ones of scan engines.)

No.	Signal			Control	Notes
	Name	Function	I/O		
1	Trigger	Start operation signal	Out	L: Start operation H: No action	
2	AIM/WUPn	(When in power down mode) Recovery signal from the power down state	Out	L: Recovery from the power down state H: No action	
		(When not in power down mode) Aiming control signal	Out	L: Aiming LED ON H: Aiming LED OFF	There are products which do not support LED.
3	Decode LED		In	L: LED ON H: LED OFF	Controlled by the command
4	BUZZER	Buzzer sounding signal	In	L: Buzzer OFF PWM: Buzzer ON	PWM signal controls the tone and the loudness of buzzer
5	POWER DOWN	Notifies power down state of the scan engine	In	L: Normal state H: Power down state	
6	RTS	Comm. Control signal to the host	In		Data output request from the scan engine
7	CTS	Comm. Control signal from the host	Out		Data output request to the scan engine
8	TxD	Data reception signal	In		Asynchronous data transmission to the host.
9	RxD	Data transmission signal	Out		Asynchronous data transmission from the host.
10	GND	System ground			
11	V _{CC}	3.3V-power supply output	Out		
12	TEST	Maintenance mode control signal	Out	L: Maintenance mode H or Open: Normal	Enters into a maintenance mode when the signal is turned to L-level.

Note: Signal names are the same with the signal names of MDL scan engines.

5. Basic Instructions

5-1. Scanning Operation

Connect the scan engine to the appropriate scan engine connector; CN1, CN2, CN5 or CN6. Then, connect the host communication; RS-232 or USB cable to CN3. Connect the power via the AC adaptor.



Turn the Power Switch (POWER) ON.



Press the Trigger Switch (TRIG) and start the scanning operation.



The Good Read (GR) LED illuminates and the BUZZER (BZ) sounds in cases of successful scans.

Note: The MDI2000 does not have a GRL nor a Buzzer output.

5-2. Aiming and Wake-up Operations

Connect the scan engine to the scan engine connector. Then, connect the host communication cable to the CN3.

Press Aiming and Wake-up Switch (A_WUP). When the scan engine is in the power down mode, it recovers from the power down mode. If the scan engine is in standby mode, the scan engine's aiming LED illuminates.

Note: There are products which do not support this type of LED illumination.

5-3. Control from the Host Computer

Universal Menu Interface (MDL/MDL Universal Menu Mode / MDI)

Use the terminal software to output commands and to display the data.

Please refer to a software specification manual of each scan engine for the details on the command menu.

6. Trouble Shooting

- Please confirm the connection of each flex cable and the host communication cable in case the scan engine does not operate even after turning on the power switch.
- Please do not connect a MDL-1000/2000 and a MDI-1000 series scan engines at the same time. It may damage the device.

7. Detailed View

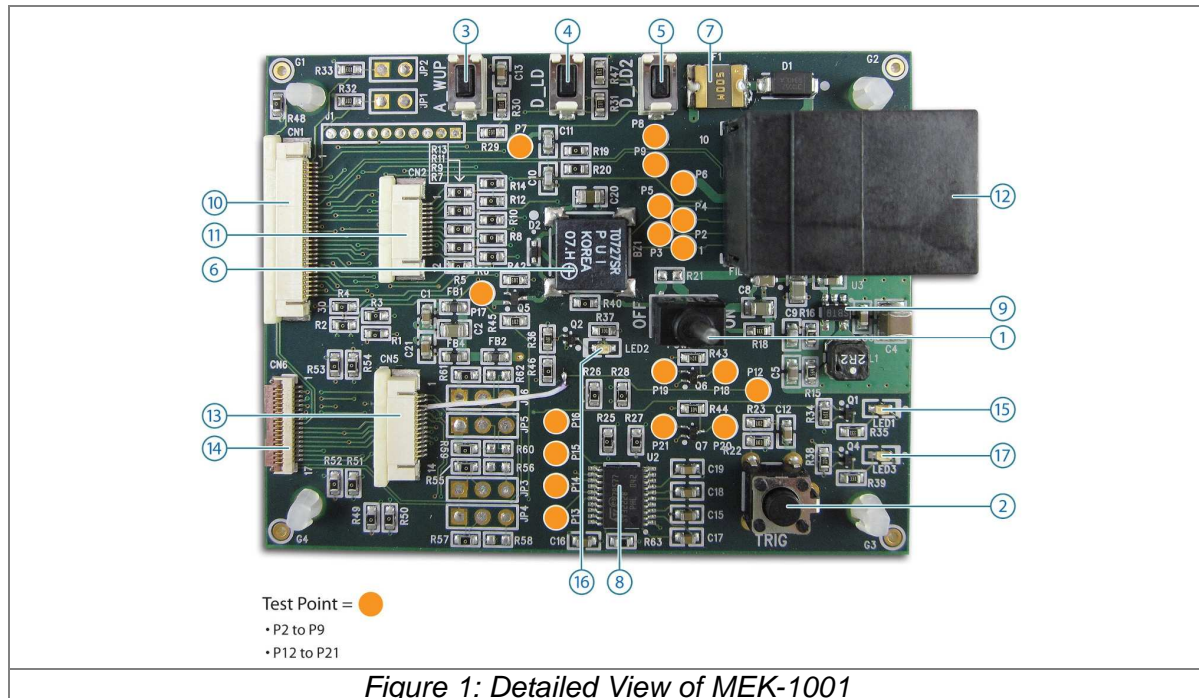


Figure 1: Detailed View of MEK-1001

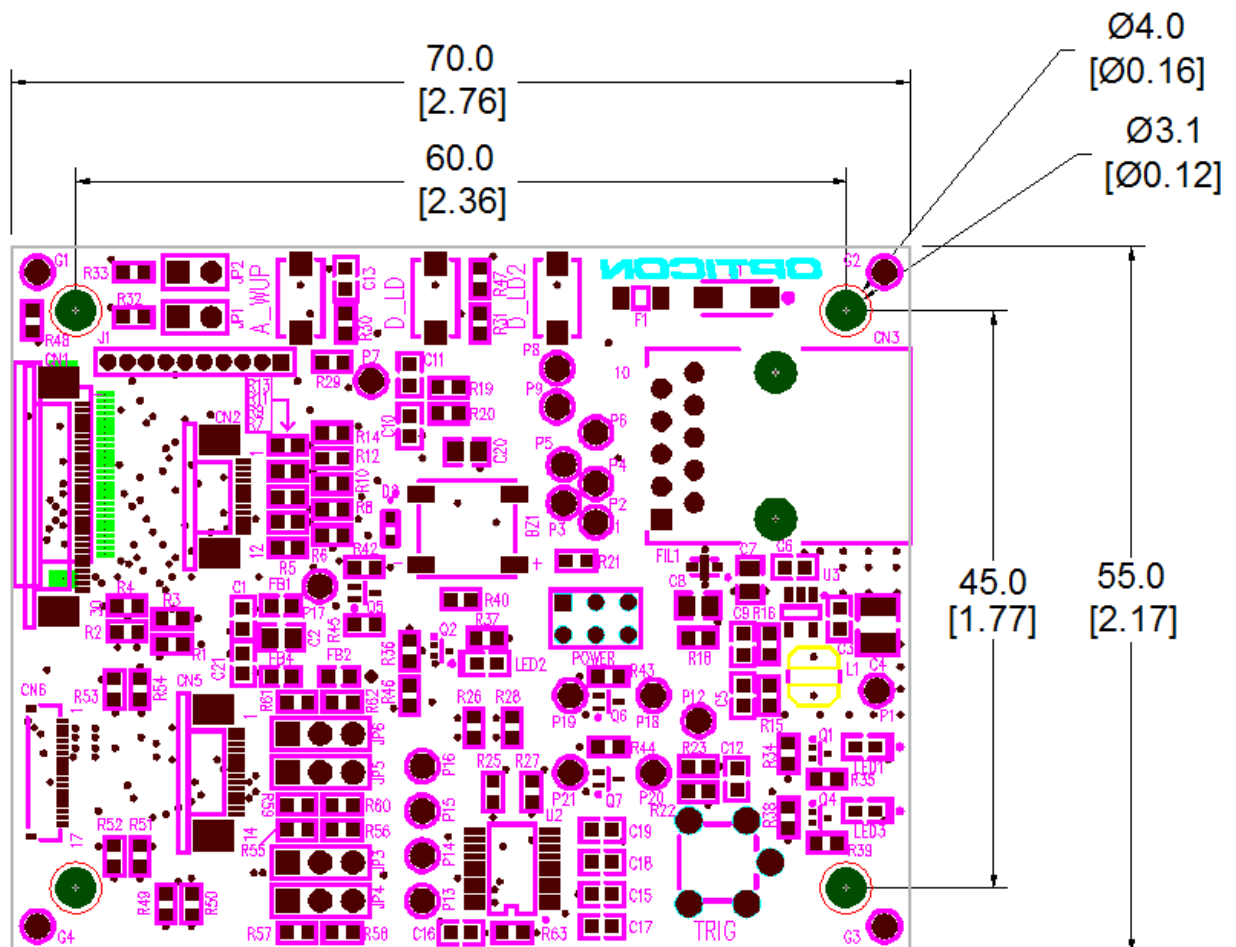
1. POWER: Power switch to activate or deactivate the device.
2. TRIG: Trigger switch to start the scanning operation
3. A_WUP: Aiming and wake-up switch
4. D_LD: Maintenance-mode switch to carry out the maintenance of a scan engine.
5. D_LD2: Second maintenance-mode switch
6. BZ1: Buzzer which sounds at the completion of successful scan. For some scan engines, this buzzer sounds when starting up the scan engine or when changing the configurations of the scan engine.
7. F1: Fuse (0.63A)
8. U2: RS-232C driver
9. U3: 3.3V DC converter
10. CN1: Connector for MDI-1000 series scan engines (30-pin)
11. CN2: Connector for MDI-2000 series scan engines (12-pin)
12. CN3: 10-pin RS-232C modular jack
13. CN5: Connector for MDI-2300 series scan engines (14-pin)
14. CN6: Connector for MDL-1000 and MDL-2000 series scan engines (17-pin)
15. LED1: (GR) Good Read LED lights in case of a successful scan. (MDL scan engines do not support this LED.)
16. LED2: (SLEEP) Power down LED
17. LED3: (EX) External illumination LED lights synchronously to the control signal from the scan engine.

Test Point: Orange colored ellipses

Appendix A: Details of the Test Points

No.	Signal Name
P2	RTS
P3	CTS
P4	TxD
P5	RxD
P6	Vcc
P7	GND
P8	USB+
P9	USB-
P12	TRIGn
P13	RxD
P14	TxD
P15	CTS
P16	RTS
P17	BUZZER

Appendix B: Mechanical Dimensions of the MEK-1001 Board



MEK1001 08-ENG07-01