JADAK|TECHNOLOGIES

FM-204 & FM-205: Getting Started

Rev E
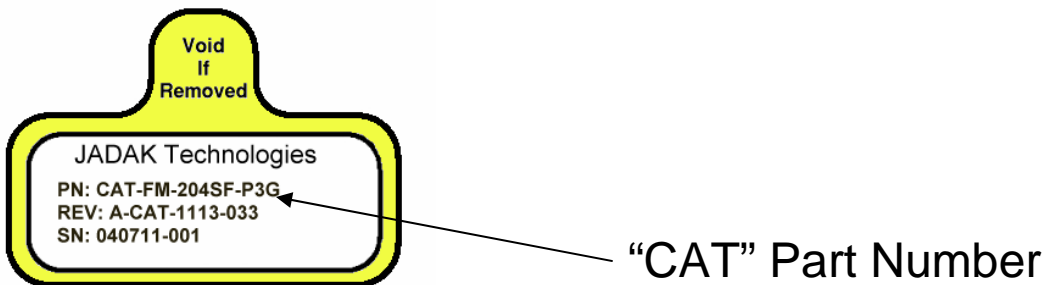
Getting Started

Unpacking Your FM-204/205

When receiving a FM-204/205, the product is either shipped as individual scanners or as part of a kit.

The kit includes the FM-204/205 scanner, RS-232 or USB Cable, Power Supply (for RS-232 version) and a CD containing various documents and information about the FM-204/205.

Identifying Your Scanner

On the bottom of your scanner you will see a yellow label as shown below:

Void
If
Removed

JADAK Technologies
PN: CAT-FM-204SF-P3G
REV: A-CAT-1113-033
SN: 040711-001

"CAT" Part Number

The configurations for the FM-204/205 are as follows:

CAT-FM-20**xyy-abc**
Where:

x =   4 for FM-204 (default product configuration)
             5 for FM-205 (same as FM-204 but with a pin available for external
             hardware trigger)

yy =   HD for High Density Reader (see appendix A for details)
             SF for Smart Focus Reader (see appendix A for details)
             SR for Standard Range Reader (see appendix A for details)

a =   P (for pinhole trigger)
b =   3 for True RS232 output
             4 for USB output
c =   G for Green Aimer
             R for Red Aimer

NOTE:
If you see a different "CAT" number or a part number starting with "KIT" then you may have a custom scanner. Please consult with JADAK Technologies to determine product configuration.

Connecting Your Scanner:
RS232 Connection
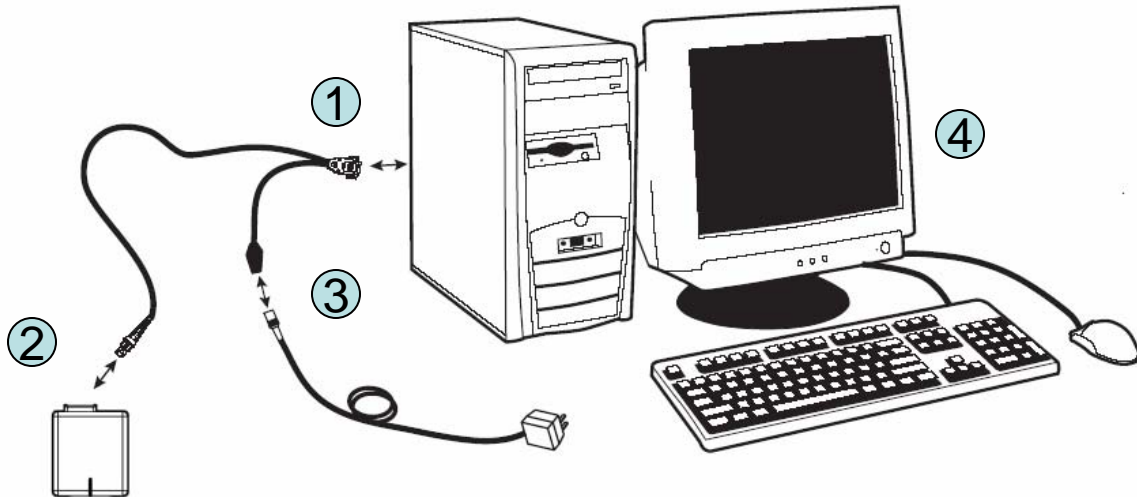
To connect your FM-204 scanner:

1. Connect RS-232 Cable to PC
2. Connect RS-232 Cable to FM-204
3. Connect Power
4. Run Demo Application "QuickView" found on the FM-204 CD

Once the QuickView application is running you can trigger the FM-204 to read bar codes via the button hole (see below) or via serial commands found in QuickView under the Menu Option: Device: Trigger On

To Trigger Manually:
Use Paper Clip or other thin object to press the button within the FM-204
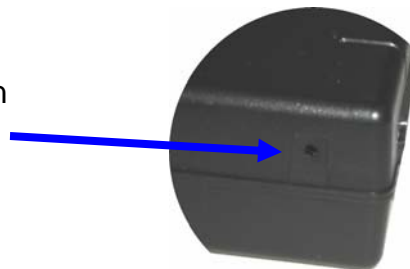
Connecting Your Scanner: USB Cable
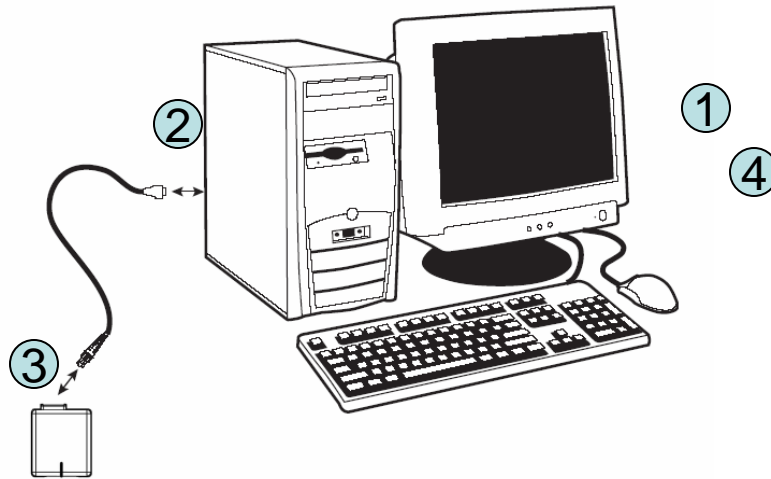
To connect your FM-204 scanner:

1. Install QuickView application found on the FM-204 CD

    This will install the USB drivers under the QuickView directory

2. Connect USB Cable to PC
3. Connect USB Cable to FM-204
4. When PC prompts for new hardware found, and asks for driver information, the USB drivers can be founder under the QuickView Drivers Directory.
5. When starting QuickView you will need to pick the proper COMM port to talk to the USB device. To do this, go to the Menu option: File: Preferences and select the proper COMM port (the USB port is typically the highest number).

- Once the QuickView application is running you can trigger the FM-204 to read bar codes via the button hole (see below) or via serial commands found in QuickView under the Menu Option: Device: Trigger On

To Trigger Manually:
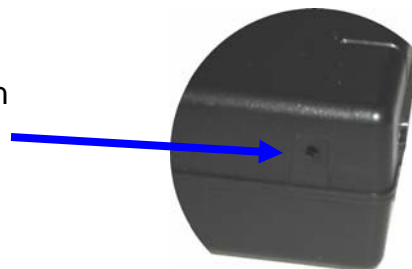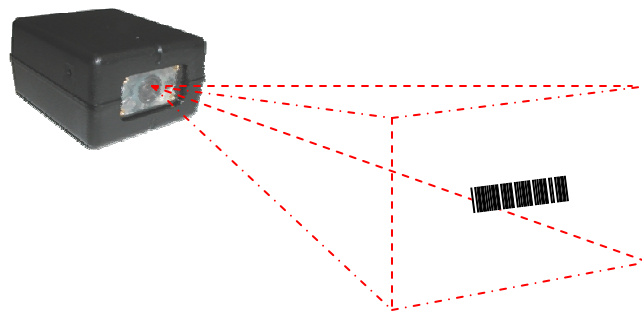Use Paper Clip or other thin object to press the button within the FM-204

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Scanning Technique

Scanning Area

Because the FM-204 is an imaging device it doesn't use a single line to scan bar codes. As such the scanning area used by the FM-204 is rectangular (640 x 480) and grows in size the farther you get from the face of the scanner, as illustrated below:

The scan window size is as follows:

Position From Front	Vertical	Horizontal	Tolerance
5.0 inches	2.42 inches	3.25 inches	.1 inch
7.0 inches	3.40 inches	4.51 inches	.17 inch
9.0 inches	4.31 inches	5.74 inches	.23 inch

Scanning Orientation

The FM-204 can read in any orientation. To assist with scanning, the FM-204 has a scan line (red or green) that appears in the middle of the imaging area. To scan simply align the aiming line in the general area of the barcode as shown below.

Product Overview:
Scanning Technology

The FM-204/205 are both area imagers, the latest in bar code scanning technology. (Note: area Imagers are also known as: 2D bar code scanners, 2D imagers, or 2D camera readers).

As compared to conventional bar code scanners that draw a single line across a bar code, area imagers take a picture of the bar code when triggered. This technique allows for:

- Reading in any orientation (360 degree reading)
- No moving parts
- Reading of newer bar code symbologies
- Reading of multiple barcodes at once
- Reading of a specific barcode in an area (e.g. only read the barcode in the left half of the image)
- Taking pictures (Application Example: Proof of Delivery)
- Vision Processing (Application Example: Detection the absence or presence of an object)

See the chart below for a comparison of scanning technologies:

Scanner Type	Scanner Technology	Scanning Technique
Wand	No Moving Parts, Contact Only, Linear Bar Codes Only	Swipe Across Bar Code
CCD	No Moving Parts, Contact to Near Contact, Linear and Stacked Linear bar codes (depending on model)	Touch scanner to Code
Laser	Moving Mirror, Near Contact to Far Distance (depending on model), Linear and Stacked Linear (e.g. PDF417) bar codes	Point and Shoot (must be aligned)
Linear Imager	No Moving Parts, Near Contact to Away (depending on model), Linear Bar Codes and Stacked Linear	Point and Shoot (linear) Swipe Up/Down (stacked)
2D Imager	No Moving Parts, Near Contact to 12" (depending on model), Linear, Stacked Linear, 2D (Matrix) bar codes, OCR, and picture taking capability	Point and Shoot, True Omnidirectional scanning

Product Overview:
Triggering Modes

There are five different methods that can be used to scan barcodes:

1. Software Trigger

   In this mode a software command is used to trigger the FM-204/205. The command structure is as follows:

   [SYN] T [CR]   To Trigger (Scanner LED's will turn on and scan barcode. After scanning the LED's will turned back off.)

   [SYN] U [CR]   To Turn off Triggering of scanner (only needed if the scanner hasn't scanned a barcode).

2. Button Trigger

   The FM204/205 has an integrated button that is useful for manually tirggering the scanner. This button is intended as a means to use the scanner for evaluation / setup purposes and is not intended for everyday application use.

   To Trigger Manually:
   Use Paper Clip or other thin object to press the button within the FM-204
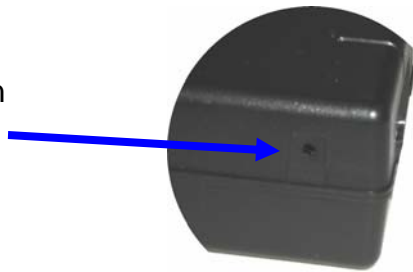


3. Hardware Trigger (FM-205 Only)

   The FM-205 can be externally triggered via a hardware line. The external trigger is active low. When pin X on the modular connector is low the FM-205 will turn on and start scanning. The FM-205 will turn off if the trigger line goes high or if a barcode is decoded (whichever happens first).

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Product Overview:
Triggering Modes

4. Scanstand Mode

    When set to scanstand mode, the FM-204/205 will look for the label below. When an object blocks view of the label the scanner will trigger and read the barcode on the object.

    To create this barcode print a FNC3 character using Code 128.
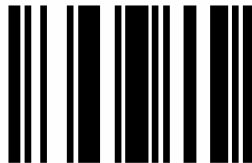
5. Presentation Mode

    Presentation mode is similar to Scanstand Mode (above) except the FM-204/205 does not require a scanstand symbol. The FM-204/205 will trigger and start scanning upon any changes in the image. This includes changes in ambient light or non-barcoded objects being placed in front of the scanner (e.g. a hand).

Reference Material:

Development Kit:

Included with the development kit is a SDK CD containing everything needed to get the FM-204/205 operational and integrated into a system.

The SDK CD contains:
- Reference Material:
    - FM-204 & FM-205 Getting Started Guide
    - FM-204 Bar Code Programming Manual
    - FM-204 Command & Communication Guide
    - FM-204 SDK User Guide
    - Data/Sell Sheets

- Software Utilities
    - QuickView – Connect to USB or RS232 device, grab images and send serial commands
    - Visual Menu – PC menuing for FM204
    - WatchIt   - RS232 utility
    - Software Libraries (SDK)

Depth Of Field:

FM-204/205 **SR** Depth of Field:

Code Size	Near Distance	Far Distance
MaxiCode 35 mil	2 inches (5.1 cm)	13 inches (33 cm)
Data Matrix 15 mil (ECC200)	3.7 inches (9.4 cm)	6.5 inches (16.5 cm)
PDF417 10 mil (ECL4)	3.1 inches (7.9 cm)	9 inches (22.9 cm)
PDF417 8 mil (ECL4)	3.3 inches (8.4 cm)	8 inches (20.3 cm)
PDF417 6.6 mil (ECL4)	4.5 inches (11.4 cm)	6.5 inches (15.9 cm)
Code 39 15 mil	2.1 inches (5.3 cm)	12.8 inches (32.5 cm)
Code 39 10 mil	3.2 inches (8.1 cm)	9.2 inches (23.4 cm)
Code 39 8 mil	3.5 inches (8.9 cm)	7.6 inches (19.3 cm)
UPC 13 mil, 100%	2.5 inches (6.4 cm)	12.5 inches (31.8 cm)
Postnet	4 inches (10.2 cm)	5.9 inches (15 cm)
OCR A, 12 pt	2.5 inches (6.4 cm)	11.8 inches (30 cm)
OCR B, 12 pt	2.5 inches (6.4 cm)	11 inches (27.9 cm)

FM-204/205 **SF** Depth of Field:

Code Size	Near Distance	Far Distance
MaxiCode 35 mil	2 inches (5.1 cm)	10 inches (25.4 cm)
Data Matrix 15 mil (ECC200)	2.3 inches (5.8 cm)	6 inches (15.2 cm)
PDF417 10 mil (ECL4)	2.2 inches (5.6 cm)	7.6 inches (19.3 cm)
PDF417 8 mil (ECL4)	2.4 inches (6.1 cm)	6.8 inches (17.3 cm)
PDF417 6.6 mil (ECL4)	2.8 inches (7.1 cm)	6 inches (15.2 cm)
Code 39 15 mil	1.5 inches (3.8 cm)	9.2 inches (23.4 cm)
Code 39 10 mil	2.2 inches (5.6 cm)	7.6 inches (19.3 cm)
Code 39 8 mil	2.3 inches (5.8 cm)	6.8 inches (17.3 cm)
Code 39 7.5 mil	2.5 inches (6.4 cm)	6.5 inches (16.5 cm)
Code 39 5 mil	3.6 inches (9.1 cm)	4.2 inches (10.7 cm)
UPC 13 mil, 100%	2.3 inches (5.8 cm)	8.9 inches (22.6 cm)
QR Code 15 mil	2.3 inches (5.8 cm)	5.9 inches (15 cm)
OCR A, 12 pt	1.7 inches (4.3 cm)	8.6 inches (21.8 cm)
OCR B, 12 pt	1.9 inches (4.8 cm)	8.5 inches (21.6 cm)
OCR A, 16 pt	2.3 inches (5.8 cm)	10.6 inches (26.9 cm)
OCR B, 16 pt	2.5 inches (6.4 cm)	9.5 inches (24.1 cm)

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Depth Of Field:

FM-204/205 **HD** Depth of Field:

| Code Size	Near Distance	Far Distance
MaxiCode 35 mil	2 inches (5.1 cm)	7.9 inches (20.1 cm)
Data Matrix 10 mil	2.5 inches (6.4 cm)	4.1 inches (10.4 cm)
Data Matrix 9 mil	2.8 inches (7.1 cm)	3.8 inches (9.7 cm)
PDF417 (ECL 4) 15 mil	2.2 inches (5.6 cm)	7.2 inches (18.3 cm)
PDF417 (ECL 4) 10 mil	1.9 inches (4.8 cm)	5.8 inches (14.7 cm)
PDF417 (ECL 4) 6.6 mil	2.1 inches (5.3 cm)	5 inches (12.7 cm)
Code 39 15 mil	1.6 inches (4.1 cm)	6.9 inches (17.5 cm)
Code 39 6 mil	2.2 inches (5.6 cm)	4.7 inches (11.9 cm)
Code 39 5 mil	2.4 inches (6.1 cm)	4.3 inches (10.9 cm)
Code 39 4 mil	2.6 inches (6.6 cm)	3.6 inches (9.1 cm)
UPC 13 mil, 100%	2.2 inches (5.6 cm)	6.5 inches (16.5 cm)
QR Code 12 mil	2 inches (5.1 cm)	4.2 inches (10.7 cm)
QR Code 10 mil	2.4 inches (6.1 cm)	3.5 inches (8.9 cm)

FM-204/205 **SR & SF** Field Of View

Position (Z distance relative to front of engine)	Vertical, avg	Horizontal, avg	Tolerance
5.0 inches (12.7 cm)	2.42 inches (6.15 cm)	3.25 inches (8.26 cm)	.1 inch (.25 cm)
7.0 inches (17.78 cm)	3.40 inches (8.64 cm)	4.51 inches (11.46 cm)	.17 inch (.43 cm)
9.0 inches (22.86 cm)	4.31 inches (10.95 cm)	5.74 inches (14.58 cm)	.23 inch (.584 cm)

FM-204/205 **HD** Field Of View

| Position (Z distance relative to front of engine)	Vertical, avg	Horizontal, avg	Tolerance
3 inches (7.62 cm)	1.4 inches (3.56 cm)	1.88 inches (4.77 cm)	.18 inch (.457 cm)
5 inches (12.7 cm)	2.33 inches (5.92 cm)	3.1 inches (7.87 cm)	.25 inch (.635 cm)

Mechanical Dimensions:
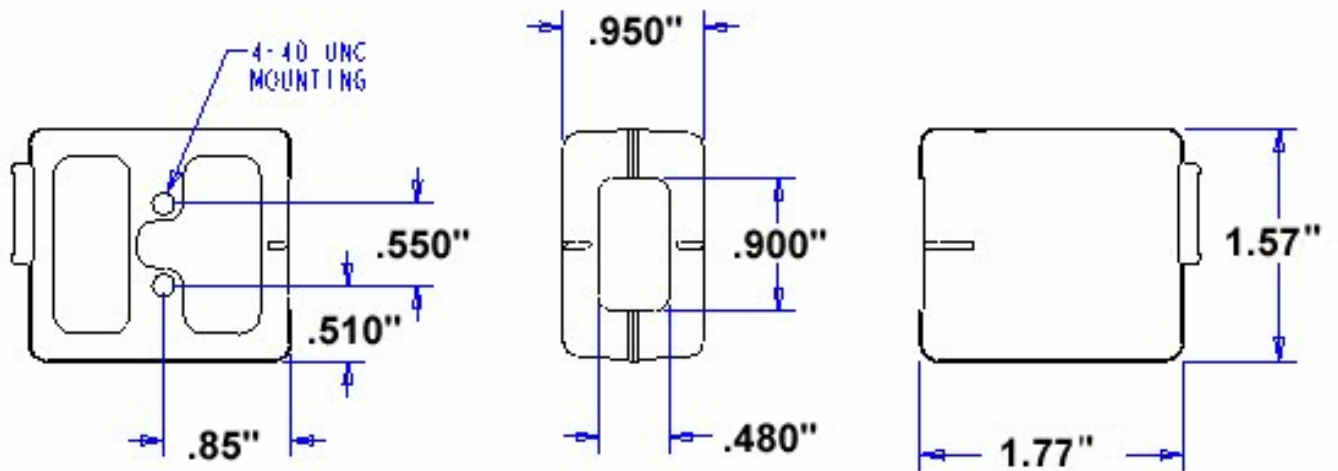
Modular Connector and Electrical Specifications :

Connector Type:
The modular jack connector is Stewart Connector Systems Inc. part number: SS-641010S-A-NF. A suggested mating connector is Stewart Connector P/N - 937-SP-36-10-10-031, or 937-SP-36-10-10-037.

Connector Pin Numbering and Orientation.

Pin 1   Pin 10

Front View
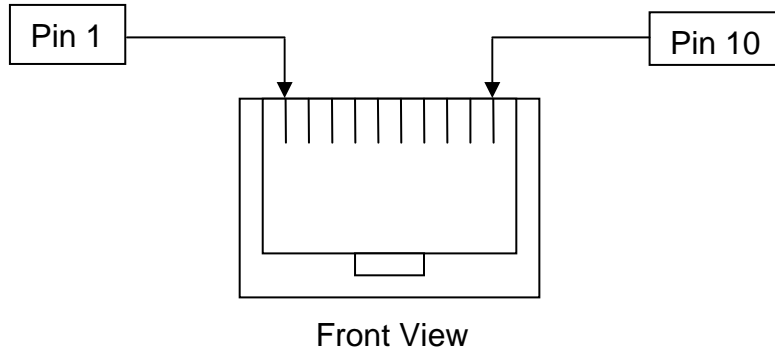
Pin Number	Pin Function True RS-232	Pin Function USB	Input/Output
1	No Connect[4]	-	-
2	Shield GND	USB D+	I/O[2]
3	No Connect[5]	No Connect	I, Weak Pull Up
4	GND	GND	-
5	RxD[1]	No Connect	I
6	TxD[1,3]	No Connect	O
7	+5 VDC	VCC	-
8	RTS[1,3]	No Connect	O
9	CTS[1]	No Connect	I
10	No Connect[6]	USB D-	I/O[2]

1. Signal is polarity selectable via menu configuration.
2. USB signal have 22 Ohm series termination resistors and speed select resistor on board I/O – I = Input, O = Output, I/O = bi-directional.
3. Pull up resistors may be applied to these signals. The resistor values should be >10k ohms.
4. Pin 1 used for external trigger. External Trigger Option on FM-205 only.
5. No Connection required for FM-204. Is compatible with HHP IT4410/4710 cables that tie +5 VDC to pin 3.
6. Note: Pin 10 was used by HHP IT4710/IT4410 for external trigger. External Trigger operation requires using JADAK model FM-205 and pin 1. (See note 4)

Statement of Agency Compliance

Statement of Agency Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference thatmay cause undesired operation.

FCC Class B Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio or television technician for help.

Caution: Any changes or modifications made to this device that are not expressly approved by JADAK Technologies Inc. may void the user's authority to operate the equipment.

Note: To maintain compliance with FCC Rules and Regulations, cables connected to this device must be shielded cables, in which the cable shield wire(s) have been grounded (tied) to the connector shell.

CE Compliance Statement

The CE mark on the product indicates that the system has been tested to and conforms with the following requirements: EN55022:1998/A1:2000/A2:2003 Class B ITE emissions requirements, EN 55024: 1998/A1:2001/A2:2003 ITE – immunity characteristics, and the Low Voltage Directive standard: EN 60950-1:2001 Information Technology Equipment – Safety- Part 1: General Requirements.

For further information please contact:
    JADAK Technologies, Inc.
    225 Greenfield Parkway.
    Suite 106
    Liverpool, NY 13088

JADAK shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

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Warranty Information

Limited Warranty

JADAK Technologies, Inc, hereby warrants its products to be function and free from manufacturing defects at the time of delivery. JADAK Technologies further warrants that it will replace or repair, at its option, any unit that fails to perform according to JADAK Technologies published specifications during a one (1) year period from the time of manufacture by JADAK Technologies.

Any attempt on the part of the user to disassemble or service the equipment shall void the warranty.

This warranty does not apply to products which have been damaged by improper handling, shipping, or misuse. The warranty dos not apply, if, in the sole opinion of JADAK Technologies, the units has been damaged by accident, misuse, neglect, improper shipping and handling. Since the unit is sensitive to static the responsibility to protect it from static damage is solely that of the user. The warranty is valid only if the unit has not been tampered with.

In no event shall JADAK Technologies or its resellers be liable for any loss, inconvenience or damage whether direct, incidental, consequential or otherwise, and whether caused by negligence or other fault resulting from the breach of any express warranty except as set forth herein. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from stat to state or country to country.

Technical Support

Need more help?

Contact JADAK Technologies today:

315-701-0678

Or

info@jadaktech.com

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