

Wi-Fi Card Data Logger (WCDL) for RFID Card Logging Applications

Quick-Reference Installation Guide
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Introduction

The Wi-Fi Card Data Logger (**WCDL**) provides realtime logging of compatible proximity card records. It is a plug-and-play solution that consists of reader/controller unit (shown above) and companion Windows software (**WCDL Client**). The hardware combines RFID (proximity) reader and non-volatile storage for up to 4000+ card transactions. (Capacity is doubled with optional memory expansion.)



Measuring 8" x 4.75" x 1.25" (excluding antenna), the WCDL unit is simple to install and requires no communications wiring. Accepting cards, fobs, or other format-compatible media, it is ideal for use in applications requiring offline capture of user transactions:

- Public/private transit
- Equipment usage
- Inventory tracking
- Student identification
- Employee attendance
- Trade shows & conventions

When a user card-scan occurs at a remote WCDL unit, its internal [WC-6150 controller](#) captures and stores the data record to non-volatile serial EEPROM memory for eventual upload. Each transaction record consists of three fields:

- Date (yymmdd)
- Time (hhmmss)
- Card ID

The **WCDL** unit automatically uploads stored record(s) when a Wi-Fi connection is established to a host computer that is running **WCDL Client** software. The software uses a proprietary polling algorithm to retrieve card data records.

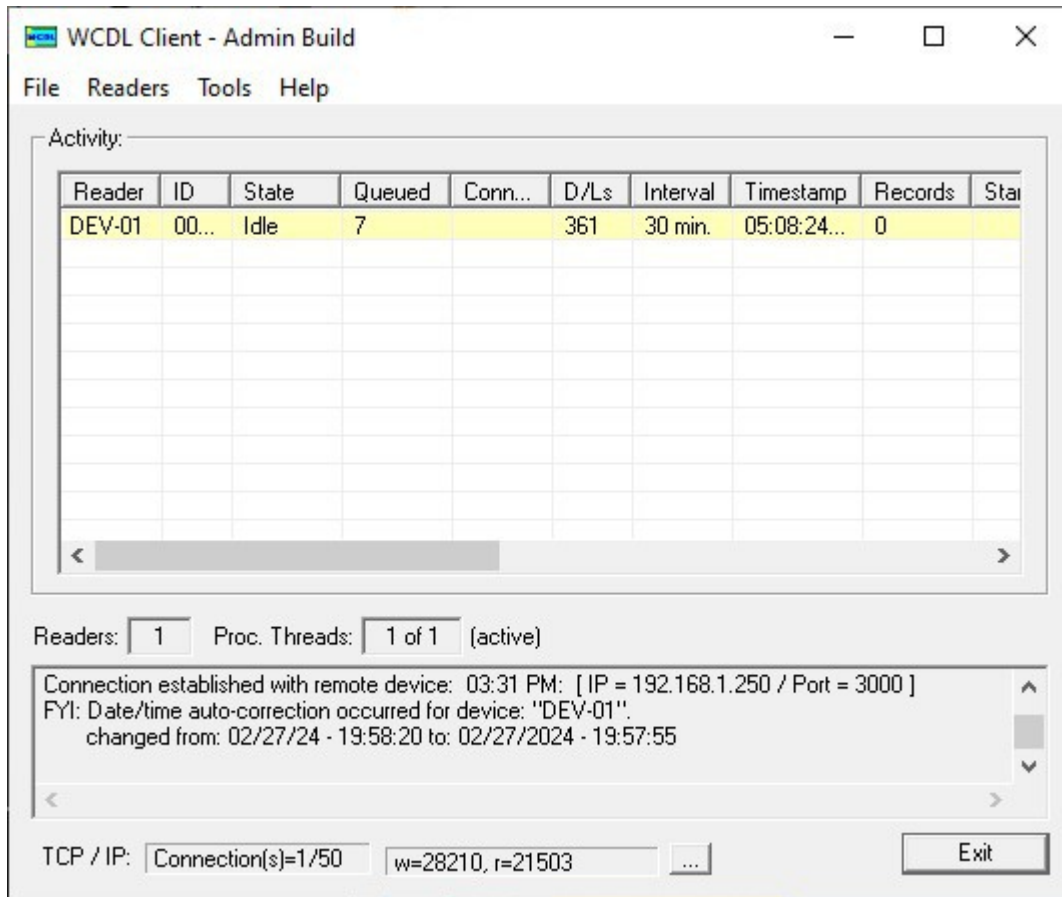
The **WCDL** unit consists of internal [WC-6150 controller](#), integrated Wi-Fi transceiver, and proximity card reader. The device accepts standard 26-bit Wiegand format and can also be customized for use with other card media formats per customer requirements. The [WC-6150 controller](#) has these features:

- Digital microcontroller
- Integrated Wi-Fi data transceiver
- Non-volatile storage for 4,000+ data records (8,000+ records ext. memory option)
- Realtime clock w/battery
- RS-232 host config. interface for Wi-Fi setup
- Onboard configuration DIP switches
- Automatic polling for retrieving captured card data
- Optional relay for external equipment control

WCDL Client Software

The WCDL system incorporates a Windows-based client application which provides necessary features, operations, and utilities for setup and capture of stored card records by one or more Wi-Fi enabled WC-6150 remote devices.

Kadtronix WCDL Client for Windows



This application is available for download at the Kadtronix website and includes a "Lite" edition that is free to use for evaluation purposes. (Compatible operating system versions include Windows 95, Vista, 7, 10, and above.) Use the secure link below to download the WCDL Client application to your PC or laptop:

https://www.kadtronix.com/downloads/wcdl_setup.zip

Available Software Editions

Kadtronix **WCDL Client** software is available in the several editions and provides the following features:

Lite (Free) Edition:

- Wireless TCP/IP communication via Wi-Fi
- Automatically download queued card data records from remote reader units.
- Retrieve and save card data transaction records to files on your computer
- Add, modify, and delete reader device(s)
- Built-in utilities for configuring & initializing remote reader communications
- Supervisory monitoring and control of remote reader units including managed TCP/IP connections and automatic date/time correction
- Supports 1 active remote reader device

Standard Edition:

- Includes all features of the lite edition, plus features listed below:
- Configurable time interval between automatic downloads
- Initiate selective on-demand downloads
- Supports up to 5 concurrently active reader devices

Premium Edition:

- Includes all features of the standard edition, plus features listed below:
- Multiple device polling threads for higher download performance
- Activate remote relay(s)
- Supports up to 50 active reader devices.

Licensing

After installing Kadtronix software on your computer, it must be appropriately licensed for use. An instructional PDF guide has been created for your convenience. The guide explains how to request a license key and subsequently activate your license.



Use the link below to download and view this tutorial guide.

https://www.kadtronix.com/downloads/sw_licensing.pdf

Note: Licensing is required only for Standard and Premium editions. The Lite edition may be freely used without a license.

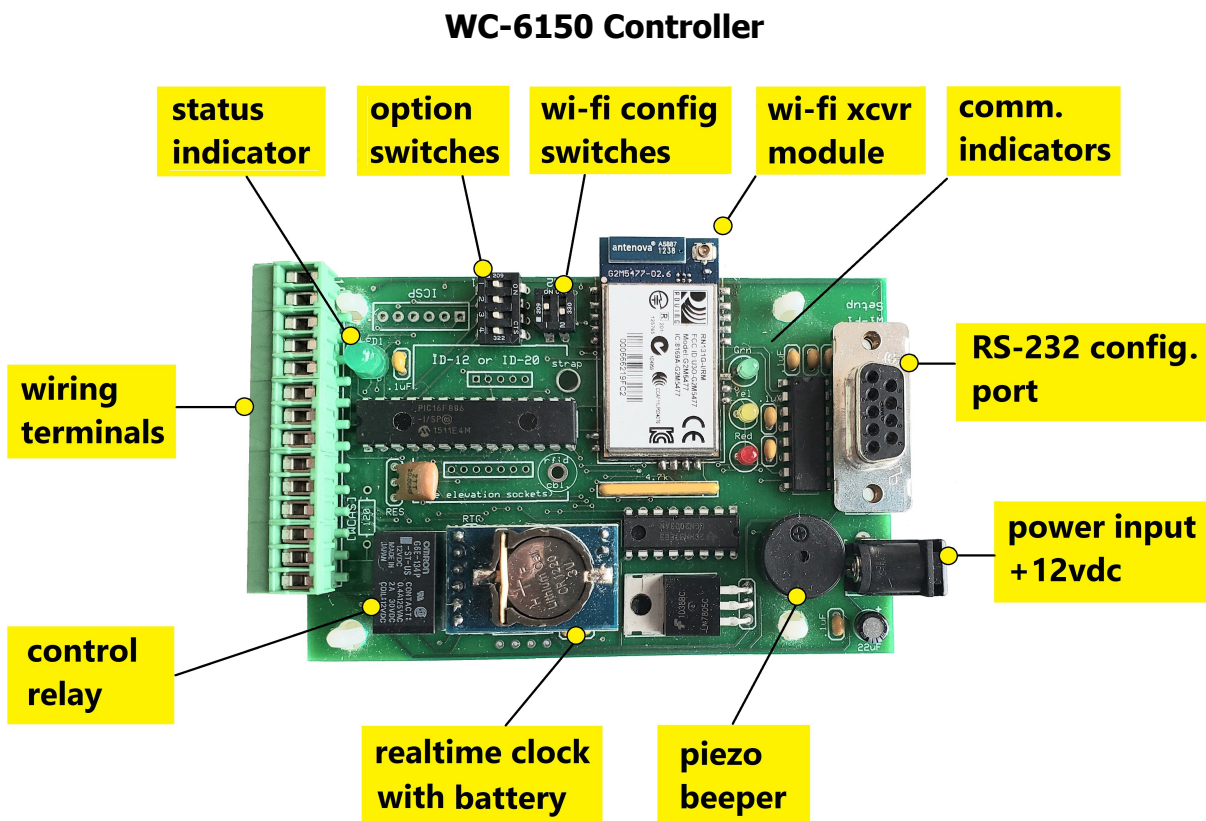
Hardware Installation & Wiring

WARNING: Be sure that power is not applied until all wiring has been completed and verified.

Begin by finding a suitable mounting location on the intended wall or pedestal. Using a pen or pencil, mark locations for two screws (not included). Drill suitable pilot holes and apply anchor hardware and/or suitable fasteners.

Before affixing **WC DL** unit to the intended mounting surface, perform wiring operations listed below. (Refer to [TB-1 Wiring Connections](#) for details.)

- Detach cover by removing four retaining screws
- Locate the 14-position wiring terminal connector on the WC-6150 controller
- Attach wiring for 12VDC power or utilize compatible AC adapter at the power input jack. (**Do not apply power or attempt to activate the device at this time.**)
- If an [external reader](#) is required, perform recommended wiring.
- If applicable, apply wiring for optional relay control



Operational Status LED

The [WC-6150 controller](#) includes onboard green status LED (located adjacent to the wiring terminal block) which provides a visual indication of the current operating state as listed in the table below:

LED Activity	Meaning
Slow periodic activity (on 1 sec., off 1 sec.)	No host connection (offline), no stored card data records
Fast periodic activity (on 1/2 sec., off 1/2 sec.)	Wi-fi host connection established, no stored card data
Two slow blinks, then off 1 sec.	No host connection (offline), card data records stored (pending)
Two fast blinks, then off 1/2 sec.	Wi-fi host connection established, card data record(s) pending
Random blinking (i.e., "flickering")	Card data record transfer (to the host) is in progress

RFID Card-Scans

The device issues a series of beep tones in response to a card scan attempt. On each scan, the device typically annunciates a series of several beeps. The first beep is issued by the card reader module as confirmation that the card format is compatible and was properly scanned. Remaining beeps are issued by the [WC-6150 controller](#) to indicate the data was successfully captured and recorded to onboard non-volatile memory.

Annunciation	Meaning
One short beep	Unspecified error (re-scan required)
Three short beeps	Scan successful - data stored to memory
Four short beeps	Scan successful - memory full, data overwrite
Continuous beep (1 to 2 sec.)	Card scan error - unexpected format

Note: If the device continually emits single-beep notification, then a power-cycle / reset may be necessary. If a long beep is sounded, the card scan was rejected due to error or the card format was incompatible.

Power / Reset Switch (optional)

While the **WCDL** is designed to provide years of reliable, trouble-free service, events including power surges and other anomalies can impact device operation. To combat these issues, you may wish to consider the following protections:

- Surge suppressor
- Power/reset switch

A surge suppressor is ideal for minimizing damage potential due to unwanted power surges or spikes. A dedicated suppressor module plugs into any standard wall outlet and offers suitable protection. Many power strips also provide inbuilt surge protection.

A power/reset switch provides capability to power down and/or reset the [WC-6150 controller](#) in the event of an anomaly. The circuit consists of a pushbutton switch, wired inline with the input power cable. (The switch can be the momentary type for quick resets, or may be a toggle or slide-action switch to allow for long-term deactivations.)

Realtime Clock (RTC)

The [WC-6150 controller](#) provides onboard realtime clock for time-stamping purposes. Accompanied by integrated lithium coin-cell battery, the module maintains consistent time and date, even when external power is lost.

Utilized primarily for tagging card data transactions, the RTC is wirelessly supervised and monitored by the [WCDL Client](#) application and may be auto-adjusted on occasion to ensure synchronization with system time.

Notes:

- Long-life lithium battery should be replaced every 5 years.
- The RTC module possesses a small amount of battery-dependent RAM which is utilized for record management. Before removing the battery, you should first be sure to upload any residual transaction records to the host computer to avoid lost data.

Wi-Fi Configuration Setup

Before a **WCDL** unit can be used it must be configured with a unique static IP address. In addition, appropriate network parameters must be provided. The list below summarizes the required information:

- Static IP address
- SSID / passphrase
- Gateway (router) address
- Netmask
- Port number

If necessary, contact your IT administrator for assistance in determining these parameter assignments for your particular network. Perform the following hardware setup operations below:

- Power off the [WC-6150 controller](#) by disconnecting the AC adapter.
- Attach USB-to-RS232 adapter to the 9-pin (DB9-female) connector on the controller. Connect opposite end to the PC.
- Locate Wi-Fi config dual-bank DIP switches as shown in the [WC-6150 controller photo](#) (see note below). Set the switch positions for Wi-Fi configuration as follows:

1 => OFF

2 => ON

Note: The [WC-6150 controller](#) provides two sets of configuration DIP switches, listed below. While the dual-bank is used for Wi-Fi configuration, the quad bank is currently unused and reserved for future setup operations.

- SW1 – Quad bank (four on/off switches) – reserved for future use
- SW2 – Dual bank (two on/off switches) – for Wi-Fi configuration

- Power up the [WC-6150 controller](#).
- If you haven't already done so, download Kadtronix **WCDL Client** software to your Windows computer.
- After installing the software, invoke the **WCDL Client** application.
- Initiate the Wi-Fi configuration tool and fill in the requested fields with required network configuration parameters. To invoke the utility, navigate the system menu as follows:

Tools → Configure WLAN devices...

- Click the "Set" button to store the parameters to the [WC-6150 controller](#). Then, use the "Get" button to retrieve the newly assigned settings. (They will be listed in a scrollable view at the bottom of the dialog.) Examine & compare the settings to confirm they are correct.
- After making necessary updates, power down the controller and assign dual-bank DIP switch settings at SW2 for normal operation as follows:

1 => ON
2 => OFF
- Detach RS-232 cable from the 9-pin connector. (The cable will no longer be needed unless it becomes necessary to modify the Wi-Fi configuration.)
- Power up the [WC-6150 controller](#)

Note: Refer to [Wi-Fi Comms Status Indicators](#) for visual confirmation of communications setup and operation via LED activity indicators.

Wi-Fi Comms Status Indicators

The onboard WLAN interface module (a.k.a., Wi-Fi transceiver) provides several onboard communications status LED indicators: red, green, & yellow. (The WLAN module is a 1-inch x 2-inch daughter-card that is mounted atop the [WC-6150 controller](#) board.) Prior to configuration, red and green indicators at the WLAN module will be constantly flashing. Once the unit has been properly configured for your network, the red indicator will extinguish.

- **Green LED:** Indicates TCP/IP connection status. "On" means an active connection, fast blink indicates no IP address, and slow blink indicates the IP address is OK but the module is not connected.
- **Yellow LED:** Toggles randomly when data transfer occurs.
- **Red LED:** Indicates network association status. Fast blink means the module is not associated with a network. "Off" indicates that it is associated and network accessible.

The table below summarizes LED states and their meanings.

Communications Status Indicators

Condition	Green	Yellow	Red
On solid	Connected over TCP/IP		
Fast blink	No IP address	Rx/Tx data transfer	Not associated
Slow blink	IP address OK, but not connected		
Off			Associated

LAN Interface Setup (if applicable)

A LAN (wired) version of the product is available by special request for connection to your network via standard Ethernet cable. For your convenience, an indicator is installed on the printed circuit board (WC-6150-LAN) which indicates TCP/IP connection status. When active, it indicates a TCP/IP connection has been established with the remote client. (In this state, no other client application may connect to the device.) When off, it indicates the device is not currently connected to a remote client and is available for connection.

Prior to use, the LAN interface must be properly configured with a static IP address and other network parameters. (A static IP address is required by the host software to allow it to properly locate and identify your hardware.) The **WCDL Client** software provides an integrated utility for performing network setup using the following menu option:

Tools -> Configure LAN devices...

This utility uses a specialized detection algorithm to locate devices on your network. (Note: This tool requires the use of UDP packets. Please consult your network IT administrator to find out if UDP packets may be transmitted.) During the initial setup, we recommend that you connect the device directly to your PC, using no router or gateway device. (A crossover cable may be required.) Otherwise, the configuration utility may not properly detect the hardware. Once the device has been properly configured, you may then locate the devices on your network in the desired configuration.

Before controller(s) can be used, each must be configured with a unique static IP address. In addition, appropriate network parameters must be provided. The list below summarizes the required information:

- IP address
- Subnet
- Gateway
- Port No. (typically 3000)

If necessary, contact your IT administrator for assistance in determining these assignments. The controller requires a configuration procedure for proper operation on your network.

Notes:

- 1: It is not necessary to power down the WC-6150-LAN controller or open the enclosure unless the Ethernet RJ-45 connector is inaccessible otherwise.
- 2: A direct connection with crossover cable is recommended for performing the config. Procedure. You should not attempt these operations through a gateway (router) device. Your computer's network LAN interface may require appropriate re-configuration. Please consult your network IT department for assistance.

Perform the following LAN configuration setup procedure below:

- Connect one end of the Ethernet crossover cable to the RJ-45 connector on the WC-6150-LAN controller. Connect the opposite end to the PC.
- Open the [WCDL Client](#) software application on your PC.
- Invoke the following menu option:

Tools -> Configure LAN devices...

- The software will automatically enter a detection sequence in an effort to find your LAN device. If the device is not found, click the "Detect" button. If still not found, please check the following:
 - Power
 - Ethernet cable attachment
 - Network configuration for your computer's network LAN interface
- Once the device is detected, populate the following fields for your network (as described previously):
 - IP address
 - Subnet
 - Gateway
 - Port No. (typically 3000)
- Click "Apply" to establish the new settings
- Confirm the new settings. (If necessary, click "Detect".)
- Detach the Ethernet crossover cable

Initialize WC-6150 Device

The [WCDL Client](#) application provides a specialized utility for the purpose of initializing a [WC-6150 controller](#) device.

IMPORTANT: *If you have not already done so, you must first [configure the device for your network](#).*

To invoke the utility, navigate the system menu as follows:

Tools → Initialize device settings...

The utility provides these functions:

- Set [RTC](#) date/time
- Create unique device ID (necessary for later identifying stored log files on your computer)

[WCDL Client](#) software not only configures remote reader devices, but also saves recorded card data transactions to files on your computer's hard drive. Stored files use a naming convention based on the current date / time and device ID as shown below:

MMDDHHMM.XXX

MM is the two-digit month, DD is the two-digit day, HH is the two-digit hour, and MM is the two-digit minute. The file extension, indicated by "XXX" above, is a multi-character device ID (see above).

The file content consists of a header and one or more data records. Each data record consists of date, time, and card number as shown below:

MM-DD-YY HH:MM:SS NNNNNNNNN

The sample listing below demonstrates the file content:

```
WCDL Client Software: v1.2.0, Badge Reader: WC-6150, v1.01, ID=00000000
12-31-10 08:10:01 010065523
12-31-10 08:29:12 010065135
12-31-10 09:41:53 010065212
```


TB-1 Wiring Connections

The [WC-6150 controller](#) provides a 14-position terminal block with the following screw terminal connections:

1. Ground
2. +12VDC in/out
3. +5V out (200 mA max.)
4. N/A
5. DATA0 (ext. card reader)
6. DATA1 (ext. card reader)
7. Ground
8. Relay contact (N/C)
9. Relay contact (COM)
10. Relay contact (N/O)
11. Aux. RS-232 Tx
12. N/A
13. N/A
14. N/A

Note 1: Only a subset of the above connections will be required in a given application.

Note 2: An optional external RFID proximity card-reader (proximity) may be used, provided that it supports a Wiegand interface.

External Reader Wiring

The WCDL unit is typically supplied with a compatible, pre-connected RFID proximity reader. If an alternative reader is preferred, there are many possible selections. The following reader is one example that has been tested with Kadtronix WC-6150 controllers:

Pyramid P-300 or P-300H Proximity Card-Reader:

Wire Color	TB-1 Wiring Terminal	Description
n/a	*7	*Shield
blk	*7	*Ground
red	2	Power (12vdc)
grn	5	Data0
wht	6	Data1
blu	n/a	No connection
brn	n/a	No connection
ora	n/a	No connection

* - Reader ground and shield wires should be tied together at the [TB-1 wiring terminal](#) block, but **not** at the prox card reader.

Outdoor Unit (optional)

The WCDL product is designed for indoor use. However, an outdoor unit is available upon request. Please contact Kadtronix for details.

Note: The outdoor unit consists of a shell that is IP65 rated. However, the shell has been modified to include wire entry opening(s). To attain a seal that is both air- and water-tight, it is imperative to seal the openings after wiring the unit. (Use silicone sealant or similar.)

Care and Maintenance:

The product requires no special care or maintenance. It is vital to shield the hardware from power surges, exposure to the outdoors (unless specially equipped), hazardous environments, and otherwise extreme conditions.

Warranty:

This product is warranted for a period of 1 year from the date of purchase and is guaranteed to be free from defects. The warranty covers the entire unit, except if any part or component has been modified or otherwise converted from its original form. The warranty does not cover damage or failure due to exposure to the elements, power surges, hazardous environments, vandalism, neglect, or improper use.

Disclaimer:

The customer assumes full responsibility for safe and competent use of the product. Neither Kadtronix nor Delahoussaye Consulting shall not be held liable or responsible for incurred damage or injury which may result due to use or misuse of this product.

Contact Information

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