icron

USB Ranger® 2201

Cat 5 USB 2.0 Extender
User Guide

Powered by

EXTREME
USB®

Thank you for purchasing the USB Ranger® 2201.

Please read this guide thoroughly.

This document applies to Part Numbers: 00-00297, 00-00298, 00-00299, and 00-00300.

FCC Radio Frequency Interference Statement Warning

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 that may cause undesired operation.

CE Statement

We, Icron Technologies Corporation, declare under our sole responsibility that the USB Ranger® 2201, to which this declaration relates, is in conformity with European Standard EMC EN-55022:2006+A1:2007 Class B, EN 61000-3-2:2006, EN 61000-3-3:2003, and EN 55024:1998+A2:2003.

IC Statement

This Class B digital apparatus complies with Canadian ICES-003.

Contents

Introduction

The instructions in this guide assume a general knowledge of computer installation procedures, familiarity with cabling requirements, and some understanding of USB devices.

note NOTE: Notes provide additional information that could be useful.

! CAUTION: Cautions provide important information about an operational requirement.

USB Ranger® 2201 Product Contents

Your USB Ranger® 2201 is packaged with:
- LEX unit (Local Extender)
- REX unit (Remote Extender)
- REX AC power adapter (1)
- USB 2.0 Cable (6 ft)
- Quick Start Guide and Warranty Information

note An additional AC power adapter may be purchased for the LEX unit in the event that your USB port can not supply the required 500mA current. Please contact an Icron Sales representative for further details (See Page 13).

Requirements

To complete the installation, you will also require the following items that are not included with the product:
- USB 1.1 or 2.0 compatible computer (host computer) with a USB compliant operating system
- USB 1.1 or 2.0 compatible device
- Cat 5 Unshielded Twisted Pair (UTP) cable with two RJ45 connectors (if using surface cabling),
- OR, Cat 5 cabling with two information outlets and two Cat 5 patch cords with RJ45 connectors (if using premise cabling)

note All references to Cat 5 cable in this document represent the minimum requirement at solid core Cat 5 unshielded twisted pair Category 6 or better or STP cable may be substituted.
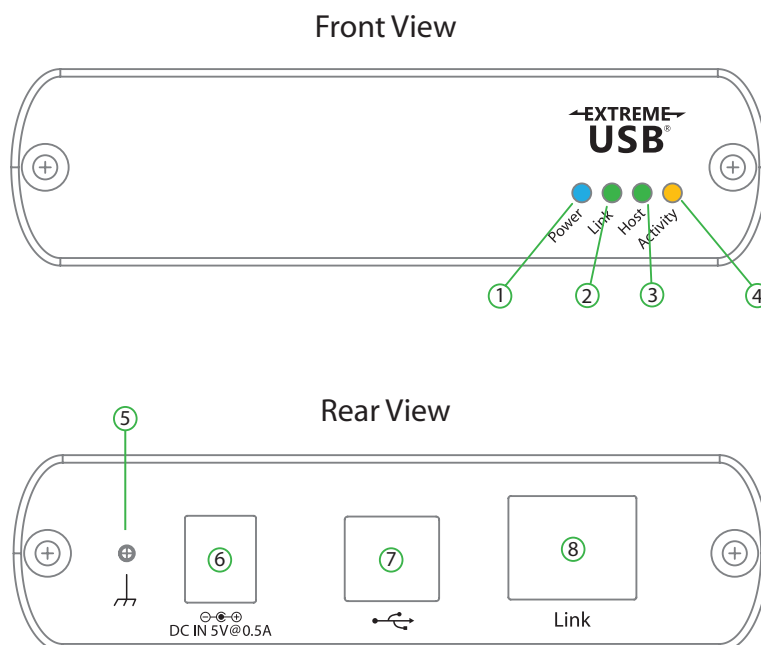
About the USB Ranger® 2201

The USB Ranger® 2201 incorporates Icron's patented ExtremeUSB® technology, enabling users to extend beyond the standard 5m cable limit for USB peripheral devices. With the USB Ranger® 2201, USB devices can be located up to 100 meters (330 feet) from the computer.

The USB Ranger® 2201 is composed of two individual units: the LEX unit and the REX unit.
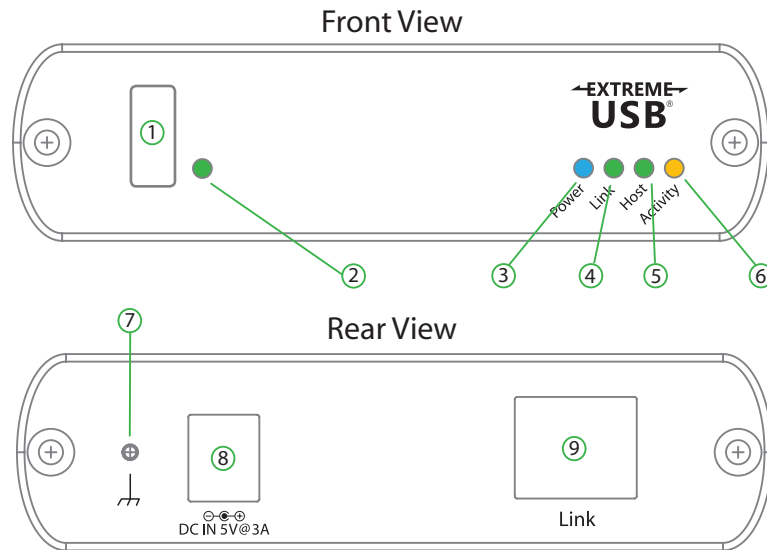
The LEX unit

The LEX unit connects to the computer using a standard USB cable. Power for this unit is provided by the USB on the host computer.

Front View

Rear View

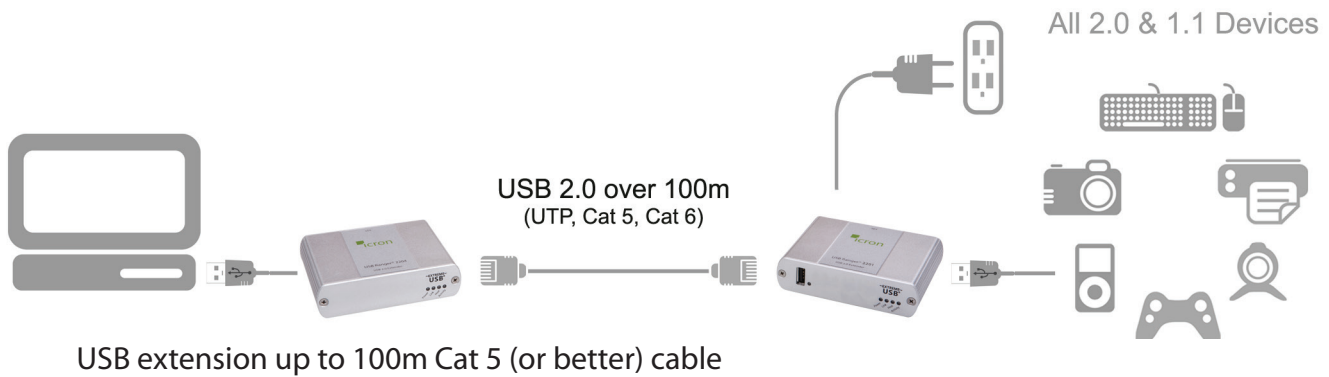| ITEM	TYPE	DESCRIPTION
1	Power LED (Blue)	LED turns on when power is supplied. Off when no power is supplied.
2	Link LED (Green)	Indicates a valid ExtremeUSB® link is established between the LEX and REX units over the Cat 5 cabling.
3	Host LED (Green)	Indicates that the USB Ranger® 2201 system is properly enumerated on the host PC.
4	Activity LED (Amber)	Indicates activity when data transmission is active between LEX and REX. LED blinks intermittently with or without a USB device connected. When the LEX and REX are in suspend mode, the LED is off.
5	Earth Ground	Optional earth ground connection to housing of unit. Accepts an M2 type screw.
6	Power Port (optional)	Not required in normal operation. An optional 5V power supply can be connected to the LEX unit to provide power if the USB port on the host PC is not capable of delivering 500mA to the unit.
7	USB Type B connector	Used to connect the LEX unit to the host computer.
8	Link Port (RJ45)	Accepts RJ45 connector for Cat 5 cabling (or better).

The REX Unit

The REX unit provides USB Type A ports for standard USB devices. The REX unit allows you to connect up to one (1) USB devices directly. Additional devices may be connected by attaching USB hubs to the REX unit. The REX unit is powered by an external AC adapter and can supply up to 500mA to each USB port.

Front View

Rear View

ITEM	TYPE	DESCRIPTION
1	Device Port (USB Type A)	Accepts USB device(s).
2	Device LED (Green/Orange)	Indicates when a USB device is connected to the Device Port. **Solid green** when device is plugged in and active. Off when device is in suspend mode or REX unit is powered off. **Orange** when the REX unit detects an overcurrent condition, and the attached USB device attempts to draw more than the 500mA current.
3	Power LED (Blue)	LED turns on when power is supplied. Off when no power is supplied.
4	Link LED (Green)	Indicates a valid ExtremeUSB® link is established between the LEX and REX over Cat 5 cabling. LED turns on when link between LEX and REX is established. Off when there is no link between LEX and REX.
5	Host LED (Green)	Indicates that the USB Ranger® 2201 system is properly enumerated on the host PC. LED blinks when in suspend state.
6	Activity LED (Amber)	Indicates activity when data transmission is active between LEX and REX. LED blinks intermittently with or without a USB device connected. When the LEX and REX are in suspend mode, the LED is off.
7	Earth Ground	Optional Earth Ground connection to housing of unit. Accepts an M2 type screw.
8	Power Port	Connects to the AC power supply. Required at REX for proper operation.
9	Link Port (RJ45)	Accepts RJ45 connector for Cat 5 cabling (or better).

Installation guide

USB 2.0 over 100m
(UTP, Cat 5, Cat 6)

All 2.0 & 1.1 Devices

USB extension up to 100m Cat 5 (or better) cable

Before you can install the USB Ranger® 2201, you need to prepare your site:

1. Determine where the computer is to be located and set up the computer.
2. Determine where you want to locate the USB device(s).
3. If you are using surface cabling, the USB Ranger® 2201 supports a maximum distance of 100m.

   OR

   If you are using premise cabling, ensure Cat 5 cabling is installed between the two locations, with Cat 5 information outlets located near both the computer and the USB device(s), and the total length, including patch cords is no more than 100m.

Installing the LEX unit

1. Place the LEX unit near the computer.
2. Install the supplied USB cable between the LEX and USB port on the host computer.

Installing the REX unit

1. Place the REX unit near the USB device(s) in the desired remote location.
2. Plug the power adapter into a suitable AC outlet.
3. Connect the power adapter to the REX unit.

Connecting the LEX unit to the REX unit

note To ensure proper operation it is recommended that only Cat 5 or better, Unshielded Twisted Pair (UTP) cabling be used to connect the LEX unit to the REX unit. The cabling must have a straight-through conductor configuration with no crossovers and must be terminated with 8 conductor RJ45 connectors at both ends. The combined length of any patch cords using stranded conductors must not exceed 10m.

With Surface Cabling

1. Plug one end of the Cat 5 cabling (not included) into the Link port (RJ45) on the LEX unit.
2. Plug the other end of the Cat 5 cabling into the Link port (RJ45) on the REX unit.

With Premise Cabling

1. Plug one end of a Cat 5 patch cord (not included) into the Link port (RJ45) on the LEX unit.
2. Plug the other end of the patch cord into the Cat 5 information outlet near the host computer.
3. Plug one end of the 2nd Cat 5 patch cord (not included) into the Link port (RJ45) on the REX unit.
4. Plug the other end of the 2nd patch cord into the Cat 5 information outlet near the USB device.

Checking the Installation

1. On the LEX and REX units, check that the Power, Host, and Link LEDs are on and that the Activity LED is blinking. If the Link LED is permanently off, then the cabling between the LEX and REX unit is not installed properly or is defective.
2. For Windows users (2000, XP, Vista, Windows 7), open Device Manager to confirm that the USB Ranger® 2201 has installed correctly. Expand the entry for Universal Serial Bus controllers by clicking the + sign. If the USB Ranger® 2201 has been installed correctly, you should find it listed as a "Generic USB Hub".
3. For Mac OS X users, open the System Profiler to confirm that the USB Ranger® 2201 has installed correctly. In the left hand column under Hardware, select "USB" and inspect the right hand panel. If the USB Ranger® 2201 has been installed correctly, you should find it listed as a "Hub" under the USB High-Speed Bus/USB Bus.
4. If the USB Ranger® 2201 is not detected correctly or fails to detect, please consult the Troubleshooting Guide.

note To open System Profiler in OS X: Open the Finder, select Applications, then open the Utilities folder and double click on the System Profiler icon.

To open Device Manager in Windows 2000 or XP: Right click "My Computer" then select: Properties >> Hardware tab >> Device Manager.

To open Device Manager in Windows Vista or Windows 7:
Open the Start menu, right click on "Computer" then select: Manage >> Device Manager.

Connecting a USB Device

1. Install any software required to operate the USB device(s). Refer to the documentation for the USB device(s), as required.
2. Connect the USB device to the device port on the REX unit.
3. Check that the device is detected and installed properly in the operating system.

Compatibility
The USB Ranger® 2201 complies with USB 1.1 and USB 2.0 specifications governing the design of USB devices. However, Icron Technologies Corporation does not guarantee that all USB devices are compatible with the USB Ranger® 2201, as there are a number of different configurations that may impact the operation of USB devices over extended distances.

Troubleshooting
The following table provides troubleshooting tips. The topics are arranged in the order in which they should be executed in most situations. If you are unable to resolve the problem after following these instructions, please contact technical support for further assistance.

PROBLEM	CAUSE	SOLUTION
All LEDs on LEX unit are off.	• The LEX unit is not receiving enough power from the USB port or the (optional) LEX AC adapter.	1. Ensure that the USB connection between the LEX and host computer is properly installed. 2. Move the USB connector to another USB port on the host computer.
All LEDs on REX unit are off.	• The REX unit is not receiving power from the AC adapter.	1. Ensure that the AC power adapter is properly connected to the REX unit. 2. Check that the AC adapter is connected to a live source of electrical power. Check that the REX power LED is illuminated.
Link LEDs on LEX unit and REX unit are off.	• There is no connection between the LEX unit and REX unit.	1. Ensure Cat 5 cable is connected between the LEX unit and REX unit. Cat 5 or better cable, UTP with a straight through connector and no crossovers, and 8 connector RJ45 connectors are used at both ends. 2. If the Cat 5 cable is defective, connect a short Cat 5 patch cord between the LEX unit and REX unit to determine if the original Cat 5 cable is defective.

PROBLEM	CAUSE	SOLUTION
Link LED on LEX unit is on, Host LED on LEX unit is off.	• The host computer is not powered on. • The LEX unit is not connected to the computer (when used with the optional LEX AC adapter). • The computer does not support USB hubs. • The USB Ranger® 2201 is malfunctioning.	1. Disconnect all USB devices from the REX unit. 2. Disconnect the LEX unit from the computer. 3. Disconnect the REX unit from the AC power adapter. 4. Reconnect the LEX unit to the computer. 5. Reconnect the REX unit to the AC power adapter. 6. In the Universal Serial Bus controllers section of Device Manager, check that the USB Ranger® 2201 is recognized as a "Generic USB Hub".
USB Ranger® 2201 units were working, but the Host LED on LEX/REX units are suddenly blinking.	• The REX unit is in suspend mode. The operating system may put the USB Ranger® 2201 in suspend mode when the computer is put into a Suspend/Standby state or when no USB devices are attached.	1. Recover/Resume the operating system from Suspend/Standby mode (see your operating system's documentation). 2. Attach a USB device to the USB Ranger® 2201.
All LEDs on both the LEX unit and REX unit are on, but the USB device does not operate correctly or is detected as an "Unknown Device" in the operating system.	• The USB device is malfunctioning. • The computer does not recognize the USB device. • The application software for the device is not operating. • The USB Ranger® 2201 is malfunctioning.	1. Disconnect the USB Ranger® 2201 from the computer. 2. Connect the USB device directly to the USB port on the computer. 3. If the device does not operate properly, consult the user documentation for the device. 4. Update your system BIOS, chipset, or USB Host controller drivers from your System/Mother-board manufacturer's website. 5. If the device operates properly when directly connected to the computer, connect another device (of a different type) to the USB Ranger® 2201. Connect the USB Ranger® 2201 to the computer. 6. If the second device does not operate, the USB Ranger® 2201 may be malfunctioning. Contact technical support for assistance. 7. If the second device does operate properly, the first device may not be compatible with the USB Ranger® 2201.

USB device is attached to REX USB port but REX device LED is off.	• A USB device must have the appropriate driver installed on the computer operating system.	1. Install the required USB device driver on the computer operating system prior to attaching the USB device to the REX unit. Please see your USB device manufacturer's website for details. 2. Consult your USB device documentation and power your USB device with the additional, USB device manufacturer supplied, power supply (if available).
Device LED is orange and units are no longer functioning.	• Overcurrent condition has occurred because USB device draws more power than can be supplied per USB specification (500mA).	1. Power cycle REX.
Host and LINK LEDs on LEX/ REX units blink intermittently.	• Firmware mismatch between the LEX and REX.	1. Use a different LEX/REX pair which have the same firmware revision. 2. Upgrade the LEX/REX firmware, contact technical support for assistance.

NOTES

Frequently Asked Questions

Please visit Icron's website for answers to FAQs: http://www.icron.com/faq

Specifications

Range	100m (330ft) over Cat 5e (or better) cable
USB device support	High-speed devices (480 Mb/s) (USB 2.0) Full speed devices (12 Mb/s) (USB 2.0 & 1.1) Low speed devices (1.5 Mb/s) (USB 2.0 & 1.1)
USB hub support	Any single chain can include up to 3 USB hubs plus one USB Ranger® 2201.
USB host support	EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)
Maximum USB devices supported	14 USB devices or 3 USB hubs with 11 USB devices.
AC adapter(s)	Input: 100/240 V AC, 50 – 60 Hz, 600 mA maximum Output: 5 V DC, 3 A
AC adapter connector	1.7 mm centre-positive jack
Current available to USB device at REX unit	500 mA
LEX unit USB connector	1 x USB Type B
LEX unit Link connector	1 x RJ45
REX unit Link connector	1 x RJ45
REX unit USB connector	1 x USB Type A
LEX unit dimensions	3.94" x 2.99" x 1.02" (100 mm x 76 mm x 26 mm)
REX unit dimensions	3.94" x 2.99" x 1.02" (100 mm x 76 mm x 26 mm)
LEX power consumption	500 mA maximum
REX power consumption	Approx. 500 mA (No Load). 1.5A (Full load)
System shipping weight	2.0 lbs. (0.9 kg)
Operating temperature range	0°C to 50°C
Storage temperature range	-20°C to 70°C
Operating humidity	20% to 80% relative humidity, non-condensing
Storage humidity	10% to 90% relative humidity, non-condensing
Regulatory testing	FCC (Class B), IC (Class B), CE (Class B)
ESD rating	EMC EN-61000-4-2 8kV Contact, 16kV Air

Limited Hardware Warranty

Icron Technologies Corporation warrants that any hardware products accompanying this documentation shall be free from significant defects in material and workmanship for a period of one year from the date of purchase. Icron Technologies Corporation's hardware warranty extends to Licensee, its customers, and end users.

The Warranty does not include repair of failures caused by: misuse, neglect, accident, modification, operation outside a normal operating environment, failure caused by service of the device by non-authorized servicers, or failure caused by a product for which Icron Technologies Corporation is not responsible.

Hardware Remedies

Icron Technologies Corporation's entire liability and the Licensee's exclusive remedy for any breach of warranty, shall be, at Icron Technologies Corporation's option, either (a) return of the price paid or (b) repair or replacement of hardware, which will be warranted for the remainder of the original warranty period or 30 days, whichever is longer. These remedies are void if failure of the hardware has resulted from accident, abuse, or misapplication.

Limitation of Liability

The hardware warranty set forth in this agreement replaces all other warranties. Icron Technologies Corporation expressly disclaims all other merchantability and fitness for a particular purpose and non-infringement of third-party rights with respect to the hardware.

Icron Technologies Corporation dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty. Under no circumstances will Icron Technologies Corporation, its suppliers or licensors be liable for any costs of procurement or substitute products or services, lost profits, loss of information or data, or any other special, indirect, consequential, or incidental damages arising in any way out of the sale of, use of, or inability to use Icron Technologies Corporation product or service, even if Icron Technologies Corporation, its suppliers or licensors have been advised of the possibility of such damages. In no case shall Icron Technologies Corporation, its suppliers and licensors' liability exceed the actual money paid for the products at issue.

Since some jurisdictions do not allow the limitation of implied warranties of liability for incidental, consequential, special or indirect damages, the above limitation may not always apply. The above limitation will not apply in case of personal injury where and to the extent that applicable law requires such liability.

Obtaining Warranty Service

To obtain warranty service, you must contact Icron Technologies Corporation within the warranty period for a Return Material Authorization (RMA) number. Icron Technologies Corporation will not accept returns without an authorized RMA number. Be sure you have the serial numbers of the LEX unit and REX unit before calling. Package the product appropriately for safe shipment and mark the RMA number on the outside of the package. The package must be sent prepaid to Icron Technologies Corporation. We recommend that you insure it or send it by a method that provides for tracking of the package. The repaired or replaced item will be shipped to you, at Icron Technologies Corporation's expense, not later than thirty days after Icron Technologies Corporation receives the defective product.

Address the returned product to:

RMA Coordinator
Icron Technologies Corporation
4664 Lougheed Highway, Suite 221
Burnaby, BC V5C 5T5 Canada

Contacting Sales

Email: sales@icron.com
Tel: 604-638-3920

Contacting Technical Support

Email: techsupport@icron.com
Tel: 604-638-3920

To help us serve you better, please include the following information with your technical support request:

- Host computer make and model
- Type of operating system installed (e.g. Windows XP, Mac OS X, Windows 7 etc.)
- Part number and serial number of both LEX unit and REX unit
- Make and model of any USB device(s) attached to the USB Ranger® 2201
- Description of the installation
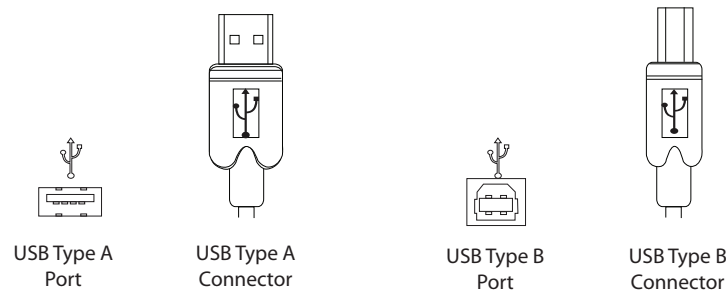- Description of the problem

Technical Glossary

Category 5 (Cat 5) Network Cabling

Category 5 cable is commonly also referred to as Cat 5. This cabling is available in either solid or stranded twisted pair copper wire variants and as UTP (Unshielded Twisted Pair) or STP (Shielded Twisted Pair). UTP cables are not surrounded by any shielding making them more susceptible to electromagnetic interference (EMI). STP cables include shielding over each individual pair of copper wires and provides better protection against EMI. Category 5 has been superseded by Cat 5e cabling which includes improved data integrity to support high-speed communications.

USB Cables

USB cables have two distinct connectors. The Type A connector is used to connect the cable from a USB device to the Type A port on a computer or hub. The Type B connector is used to attach the USB cable to a USB device.

| USB Type A Port | USB Type A Connector | USB Type B Port | USB Type B Connector |

RJ45

The Registered Jack (RJ) physical interface is what connects the network cabling (Cat 5) to the LEX unit and REX unit. You may use either the T568A scheme (Table 1) or the T568B scheme (Table 2) for cable termination as the USB Ranger® 2201 uses all four pairs of the cable. RJ45 connectors are sometimes also referred to as 8P8C connectors.

RJ45 Pin Positioning

Table 1 - T568A Wiring

PIN	PAIR	WIRE	CABLE COLOR
1	3	1	WHITE/GREEN
2	3	2	GREEN
3	2	1	WHITE/ORANGE
4	1	2	BLUE
5	1	1	WHITE/BLUE
6	2	2	ORANGE
7	4	1	WHITE/BROWN
8	4	2	BROWN

Table 2 - T568B Wiring

PIN	PAIR	WIRE	CABLE COLOR
1	2	1	WHITE/ORANGE
2	2	2	ORANGE
3	3	1	WHITE/GREEN
4	1	2	BLUE
5	1	1	WHITE/BLUE
6	3	2	GREEN
7	4	1	WHITE/BROWN
8	4	2	BROWN

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