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SCHOTT ColdVision CV-LS Light Source

User Manual

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Safety Information

Introduction

Read these instructions carefully and look at the equipment to become familiar with the device before operation. The following special messages may appear throughout this manual to warn of potential hazards:



CAUTION

CAUTION indicates a potentially hazardous situation that, if not avoided, **can result** in injury or equipment damage.

Electrical equipment should only be installed, operated, serviced, and maintained only by qualified personnel. SCHOTT North America assumes no responsibility for any consequences arising out of the use of this material.

Intended Use

The ColdVision Light Source (CV-LS) is a high intensity LED light source intended for use with fiber optic illuminators. This light source has state of the art light output and a simplified user interface with versatile remote control abilities. The CV-LS is compatible with all standard ColdVision Series light guides. Optimal performance is achieved when coupled with larger bundles diameters, 9-14mm.

The CV-LS currently has the following options available:

- A20980/6000K (Cool White Light Source)
- A20980/3000K (Warm White Light Source)

Additional configurations available (minimum quantities and lead times may apply):

- A20980/RGBW (RGBW Light Source)
- A20980/400NM (400NM UV Light Source)

All of these product models have industry leading light outputs, with the Cool White Light Source model topping 150W EJA halogen lamp levels. Solutions with other wavelengths, including four-channel combinations, can be produced to match specific customer application requirements.

Safety Information

The CV-LS has many advanced features including:

- Ethernet, RS232, and USB (Virtual RS232) [Backwards compatible with the LLS 3]
- Ethernet [Robust binary interface for accelerated communications]
- Analog Controls [0-5V standard input]
- Digital Controls [0-24V standard input]
- Triggered or Continuous Strobe [up to 10KHz]
- 25 microsecond rise time on strobe pulses
- Auto sensing inputs with control lockouts via command interfaces
- Web interface for control, user management, remote upgrade, etc.

Scope

This manual is designed to provide users with the technical information needed to operate the CV-LS. The units described in this manual are:

- A20980/6000K (Cool White Light Source)
- A20980/3000K (Warm White Light Source)
- A20980/RGBW (RGBW Light Source)

Validity

SCHOTT North America cannot be held responsible for any errors in this manual. Please contact us if you have any suggestions for improvements, modification, or corrections.

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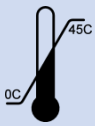
Safety Information

Symbols

Symbols used on this product or in this manual are described in the following table:

Symbols	Description
	Read the manual before operating the unit.
	Caution: Surface may be hot.
	Certified by Intertek. See Certification section on page 11 for compliance information.
	European Declaration of Conformity
	RoHS Compliant, also known as Directive 2011/65/EU
	Compliant with the Waste Electrical and Electronics Equipment/Restriction of the Use of Certain Hazardous Substances in Electrical and Electronics Equipment (WEEE/RoHS) Recycling directives
	Operational Temperature Range: 0°C – 45°C
	Operational Humidity Range: 5% - 95% Noncondensing
	DC Power Input

Related Documents

Title of Document	Reference Number
CV-LS Data Sheet	
CV-LS Programming Guide	

Safety Information

Product Related Warnings

All relevant local safety regulations must be followed when installing and using this product. For safety reasons, and to ensure conformity with assembly standards, only the manufacturer is authorized to repair the components.

CAUTION

Never look directly at the LED output when on. LEDs have a very high luminance that can cause eye injury. Do not look at beam with optical instruments.
Use Ultraviolet (UV) protective goggles when using a UV light source.

CAUTION

Light absorbing materials have the physical property of converting incident light into heat. Damage may occur to heat sensitive or flammable light absorbing materials. To avoid such thermal damage and the potential danger of fire or burns, please adhere to the following instructions:

- Do not cover the light guide exit.
- Do not place any part of your body in the light output path.
- When illuminating heat sensitive or flammable light absorbing objects (e.g. in microscopy), special care must be taken to keep an appropriate distance between the light guide and the object(s). Special care must also be taken to select a suitable lamp brightness level in order to avoid thermal damage to the object(s).
- To avoid unnecessary strain on biological tissue caused by illumination with visible light, reduce the brightness and duration of illumination to the absolute minimum level required.
- Do not cover the front or rear vents when operating the unit. Airflow must be unrestricted to allow full light output and maintain life of the LED.
- Use only power cords with appropriate connectors for secure use.
- Disconnect power cord when unit will be left unused for long periods.
- Do not use this unit near any liquids, or in an area with excessive moisture.
- Do not place flammable materials on or near the unit.
- Use only standard glass cleaners. Do not use solvents, petroleum distillates, or any volatile or flammable liquids or foams.
- Never spill liquid on the unit.
- Do not service the unit beyond what is described in this manual. Return the light source to an authorized service center. For a Return Material Authorization (RMA), see page 91.

Safety Information

Cleaning

Both the housing and the front and back plates have a durable finish that should retain its original luster for many years. Cleaning the exposed areas with a commercial glass cleaner will help to maintain the finish.

Before beginning, remove the cord from the light source. Wipe the exposed areas of the housing with either a soft cloth or a paper towel moistened with a commercial glass cleaner.

CAUTION

Do not use detergents, excess water, treated cloths, harsh cleaning or flammable agents or sprays. If fluid spills into the interior, let the unit dry thoroughly before using. Periodically, any visible dust accumulation should be removed using a vacuum or commercially available can of compressed air.

Certifications

The ColdVision Light Source conforms to the provisions of the following European directives:

- 2014/35/EU (Low Voltage Directive)
- 2014/30/EU (EMC Directive)
- 2011/65/EU (RoHS)

The illumination systems observance of the basic requirements set forth in the directives mentioned above is verified by technical documentation and in full compliance with the standards listed below:

Category	Standards
EMC	EN IEC 61326-1:2021 FCC CFR47 Part 15B:2015 Japan Deviations
Safety	CENELEC EN 61010-1:2010/A1 UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1;U3
Photo-biological	IEC 62471:2006

Assembly Location

SCHOTT Technologies Mexico, S.A. de C.V.
Carretera México-Veracruz Km.349 Venta Parada,
Amatlán de los Reyes, Veracruz México 94946
Phone: +52 (271) 7166-316

Safety Information

Liabilities

Any warranty implied under State Law shall be limited to one year from original date of delivery to the original purchaser. Specifically excluded from SCHOTT liability is damage resulting from acts of any deity, malicious mischief, vandalism, riots, wars, improper installation, or neglect in the operation or maintenance of the unit or misunderstanding of the properties of the unit. Under no circumstances shall SCHOTT be liable for consequential or other damages of any kind, losses or expenses in connection with, by reason of the use, or inability to use, of this unit for any. The stated warranty provides the purchaser with specific legal rights, which vary from state to state. Some states, for example, do not allow exclusion of consequential damage.

Comments

We welcome your feature requests and comments about this document.

You can reach us by e-mail at info.microscopy@us.schott.com

Sicherheitshinweise

Einführung

Lesen Sie diese Anleitung aufmerksam durch, und schauen Sie sich, um mit dem Gerät vertraut zu werden, das Gerät vor der Anwendung an. Zur Warnung vor potenziellen Gefahren werden die folgenden speziellen Hinweise in diesem Handbuch verwendet:

VORSICHT

VORSICHT kennzeichnet eine möglicherweiser gefährliche Situation, die, wenn sie nicht vermieden wird, zu Verletzungen bzw. zu Schäden an dem Gerät führen kann.

Elektrotechnische Geräte sollte nur durch Fachpersonal installiert, betrieben, gewartet und gepflegt werden. SCHOTT North America übernimmt keine Verantwortung für irgendwelche Folgen, die sich aus der Nutzung dieses Materials ergeben könnten.

Bestimmungsgemäße Verwendung

Die Lichtquelle ColdVision (ColdVision Light Source, CV-LS) ist eine LED-Lichtquelle mit hoher Intensität für den Einsatz in LWL-Beleuchtungen. Diese Lichtquelle besitzt eine moderne Lichtausgabeleistung und eine vereinfachte Bedieneroberfläche mit vielseitigen Fernbedienungsfähigkeiten. Die CV-LS ist kompatibel mit allen Standard-Lichtleitern der Serie ColdVision. Eine optimale Leistung wird in Verbindung mit größeren Bündeldurchmessern von 9-14 mm erzielt.

Die folgenden Optionen sind derzeit für die CV-LS lieferbar:

- A20980/6000K (kaltweiße Lichtquelle)
- A20980/3000K (warmweiße Lichtquelle)

Zusätzliche Konfigurationen sind lieferbar (Mindestmengen und Lieferzeiten können anfallen):

- A20980/RGBW (RGBW-Lichtquelle)
- A20980/400NM (400-nm-UV-Lichtquelle)

Alle diese Produktmodelle besitzen in der Industrie führende Lichtausgaben, wobei das Modell mit kaltweißer Lichtquelle die Ausgabeleistung einer 150-W-EJA-Halogenlampe überschreitet. Zum Entsprechen anwendungsspezifischer Anforderungen, einschließlich 4-Kanal-Kombinationen, können Kunden-Lösungen mit anderen Wellenlängen hergestellt werden.

Die CV-LS verfügt über viele erweiterte Funktionen, einschließlich:

- Ethernet, RS232 und USB (virtuelle RS232-Schnittstelle) [abwärtskompatibel mit der LLS-3]
- Ethernet [stabile binäre Schnittstelle für eine beschleunigte Kommunikation]
- Analoge Steuerungen [0-5 V-Standardeingang]
- Digitale Steuerungen [0-24 V-Standardeingang]
- Getriggerter oder kontinuierlicher Abtastimpuls [bis 10 kHz]
- 25-µs-Anstiegszeit bei Abtastimpulsen
- Automatische Erkennung von Eingängen mit einer Steuerungsblockierung über die Befehlsschnittstellen
- Web-Schnittstelle zur Steuerung, Benutzerverwaltung, für dezentrale Aktualisierungen usw.

Informationen über diese Funktionen sind im technischen CV-LS-Bedienerhandbuch enthalten.

Anwendungsbereich

Dieses Handbuch enthält technische Informationen, die Bediener zum Betrieb der CV-LS benötigen. Die in diesem Handbuch beschriebenen Einheiten sind:

- A20980/6000K (kaltweiße Lichtquelle)
- A20980/3000K (warmweiße Lichtquelle)
- A20980/RGBW (RGBW-Lichtquelle)

Geltung

SCHOTT North America kann nicht für eventuell in diesem Handbuch enthaltene Fehler verantwortlich gemacht werden. Bitte kontaktieren Sie uns, wenn Sie Anregungen für Verbesserungen, Änderungen oder Korrekturen geben können.

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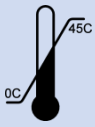
Sicherheitshinweise

Symbole

Die auf diesem Produkt oder in diesem Handbuch verwendeten Symbole sind in der folgenden Tabelle beschrieben:

Symbole	Beschreibung
	Lesen Sie das Handbuch, bevor Sie das Gerät betreiben.
	Vorsicht: Die Oberfläche kann heiß sein.
	Durch Intertek zertifiziert. Für Kompatibilitätsinformationen gehen Sie auf Seite 11 zum Abschnitt Zertifizierung.
	Europäische Konformitätserklärung
	RoHS-konform, wie in Richtlinie 2011/65/EU beschrieben
	Konform mit den Recycling-Richtlinien bezüglich der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronik-Geräten (Waste Electrical and Electronic Equipment, WEEE/RoHS)
	Betriebstemperaturbereich: 0 °C – 45 °C
	Betriebsfeuchtigkeitbereich: 5 % bis 95 %, nicht kondensierend
	DC-Eingangsspannung

Zugehörige Dokumente

Titel des Dokuments	Referenznummer
Technisches CV-LS-Bedienerhandbuch	
CV-LS-Datenblatt	

Sicherheitshinweise

Produktbezogene Warnungen

Bei der Installation und Anwendung dieses Produktes müssen alle relevanten örtlichen Sicherheitsvorschriften eingehalten werden. Aus Sicherheitsgründen und zur Gewährleistung der Übereinstimmung mit Zusammenbaunormen ist nur der Hersteller zur Reparatur von Komponenten berechtigt.

VORSICHT

Blicken Sie nie direkt auf die aktivierte LED-Ausgabe. LEDs besitzen eine sehr hohe Leuchtdichte, die Augenverletzungen verursachen können. Schauen Sie nicht mit optischen Instrumenten in den Lichtstrahl.
Verwenden Sie beim Einsatz einer UV-Lichtquelle eine Schutzbrille gegen ultraviolette Strahlen (UV).

VORSICHT

Lichtabsorbierende Materialien verfügen über die physikalische Eigenschaft, einfallendes Licht in Wärme umzuwandeln. Schäden können an hitzeempfindlichen oder brennbaren lichtabsorbierenden Materialien auftreten. Bitte beachten Sie die folgenden Anweisungen, um solche thermischen Schäden und potentiellen Gefahren durch Feuer oder Verbrennungen zu vermeiden:

- Bedecken Sie niemals den Lichtleiterausgang.
- Halten Sie niemals Körperteile in den Lichtausgabestrahl.
- Bei der Beleuchtung hitzeempfindlicher oder lichtabsorbierender brennbarer Objekte (z. B. in der Mikroskopie) muss besonders sorgfältig vorgegangen werden, um einen angemessenen Abstand zwischen dem Lichtleiter und dem oder den Objekt(en) einzuhalten. Besondere Sorgfalt muss auf die Auswahl einer geeigneten Lampenhelligkeitsstufe, die eine thermische Schädigung des Objektes/der Objekte vermeidet, aufgewendet werden.
- Reduzieren Sie zur Vermeidung einer unnötigen Belastung biologischen Gewebes durch eine Beleuchtung mit sichtbarem Licht die Helligkeit und die Dauer der Beleuchtung auf das erforderliche absolute Minimum.
- Decken Sie beim Betrieb der Einheit nicht die vorderen oder hinteren Lüftungsöffnungen ab. Eine uneingeschränkte Luftzirkulation muss für eine vollständige Lichtleistung und zur Verlängerung der Lebensdauer der LED gewährleistet werden.
- Verwenden Sie für eine sichere Verwendung nur Netzkabel mit entsprechenden Anschlüssen.
- Ziehen Sie das Netzkabel aus der Steckdose, wenn das Gerät für längere Zeit nicht benutzt wird.
- Verwenden Sie dieses Gerät nicht in der Nähe von Flüssigkeiten oder in Bereichen mit übermäßiger Feuchtigkeit.

- Stellen Sie keine brennbaren Materialien auf die oder in die Nähe der Einheit.
- Verwenden Sie nur Standard-Glasreiniger. Verwenden Sie keine Lösungsmittel, Erdöldestillate bzw. flüchtige oder brennbare Flüssigkeiten und Schäume.
- Verschütten Sie niemals Flüssigkeiten auf dem Gerät.
- Führen Sie keine Wartungsarbeiten am Gerät über den in diesem Handbuch beschriebenen Umfang hinaus aus. Senden Sie hierzu die Lichtquelle zu einem autorisierten Servicecenter zurück. Für eine Materialrücksendeautorisierung (Return Material Authorization, RMA) gehen Sie bitte zu Seite 91.

Reinigung

Das Gehäuse sowie die Front- als auch die Rückwand besitzen eine haltbare Oberfläche, die für viele Jahre ihren ursprünglichen Glanz beibehalten sollten. Die Reinigung der exponierten Flächen mit einem kommerziellen Glasreiniger unterstützt das Erreichen dieses Ziels.

Entfernen Sie vor Beginn von Reinigungsarbeiten das Netzkabel der Lichtquelle. Benutzen Sie zur Reinigung der exponierten Bereiche des Gehäuses sowie der Front- und Rückwände entweder ein mit einem kommerziellen Glasreiniger angefeuchtetes weiches Tuch oder Papiertuch.

VORSICHT

Verwenden Sie keine Reinigungsmittel, sehr viel Wasser, vorbehandelte Tücher, scharfe oder brennbare Reinigungsmittel oder -sprays. Lassen Sie das Gerät vor der Anwendung gründlich trocknen, falls Flüssigkeit in das Innere des Gerätes gelangen sollte. Eine sichtbare Staubansammlung sollte in regelmäßigen Abständen mit einem Staubsauger oder einer handelsüblichen Druckluftdose entfernt werden.

Sicherheitshinweise

Zertifizierungen

Die Lichtquelle ColdVision entspricht den folgenden europäischen Richtlinien:

- 2014/35/EU (Niederspannungs-Richtlinie)
- 2014/30/EU (EMV-Richtlinie)
- 2011/65/EU (RoHS)

Die Einhaltung der Anforderungen der oben genannten Richtlinien durch die Beleuchtungssysteme wird durch die technische Dokumentation und in voller Übereinstimmung mit den nachfolgend aufgeführten Normen geprüft:

Kategorie	Normen
EMV	EN IEC 61326-1:2021 FCC CFR47 Teil 15B:2015 Japanische Abweichungen
Sicherheit	CENELEC EN 61010-1:2010/A1 UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1;U3
Fotobiologisch	IEC 62471:2006

Produktionsort

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Sicherheitshinweise

Haftungen

Die nach Gesetzen implizierte Gewährleistung ist ab der Lieferung an den ursprünglichen Käufer auf ein Jahr begrenzt. Ausdrücklich von der Haftung von SCHOTT ausgeschlossen sind Schäden durch höhere Gewalt, Sachbeschädigungen, Vandalismus, Aufruhr, Kriege, unsachgemäße Installation oder Vernachlässigung im Betrieb oder Schäden in Folge der Wartung des Geräts bzw. aus Missverständnissen der Eigenschaften des Gerätes. SCHOTT haftet unter keinen Umständen für Folge- oder andere Schäden jeglicher Art, Verluste oder Aufwendungen in Zusammenhang mit, aufgrund der Nutzung oder der Nichtverfügbarkeit dieser Einheit. Die erklärte Garantie räumt den Käufer bestimmte gesetzliche Rechte ein, die von Staat zu Staat variieren. Einige Staaten erlauben keinen Ausschluss von beispielsweise Folgeschäden.

Kommentare

Wir begrüßen Ihre Wünsche und Kommentare zu diesem Dokument.

Sie erreichen uns per E-Mail unter info.microscopy@us.schott.com

Información de seguridad

Introducción

Lea atentamente estas instrucciones y estudie el equipo para familiarizarse con el dispositivo antes de utilizarlo. Los siguientes mensajes especiales pueden aparecer a lo largo de este manual para advertir de posibles peligros:

PRECAUCIÓN

PRECAUCIÓN indica una situación de posible peligro que, de no evitarse, podría provocar lesiones o daños en los equipos.

Los equipos eléctricos únicamente deben instalarse, operarse, repararse y mantenerse por personal cualificado. SCHOTT North America no asumirá responsabilidad alguna por las consecuencias que se deriven del uso de este material.

Uso previsto

La fuente de luz ColdVision (ColdVision Light Source, CV-LS) es una fuente de luz LED de alta intensidad para usar con iluminadores de fibra óptica. Esta fuente de luz tiene una potencia lumínica vanguardista y una interfaz de usuario simplificada con funciones de control remoto versátil. La CV-LS es compatible con todas las guías de luz estándar de la serie ColdVision. El rendimiento óptimo se obtiene cuando se acopla con diámetros de haces más grandes de 9-14 mm.

La CV-LS dispone actualmente de las siguientes opciones:

- A20980/6000K (fuente de luz blanca fría)
- A20980/3000K (fuente de luz blanca cálida)

Configuraciones adicionales disponibles (pueden aplicarse plazos y cantidades mínimas):

- A20980/RGBW (fuente de luz RGBW)
- A20980/400NM (fuente de luz UV 400NM)

Todos estos modelos de productos tienen potencias lumínicas líderes del sector, y el modelo de fuente de luz blanca fría supera los niveles de halógenos EJA de 150 W. Se pueden producir soluciones con otras longitudes de onda, incluidas las combinaciones de cuatro canales, para ajustarse a los requisitos de aplicación específicos del cliente.

Información de seguridad

La CV-LS presente numerosas funciones avanzadas:

- Ethernet, RS232, y USB (RS232 virtual) [compatible con el modelo anterior LLS 3]
- Ethernet [interfaz binaria resistente para comunicaciones aceleradas]
- Controles analógicos [entrada estándar de 0-5 V]
- Controles digitales [entrada estándar de 0-24 V]
- Estrobo continuo o por disparo [hasta 10 KHz]
- Tiempo de subida de 25 microsegundos en impulsos estroboscópicos
- Entradas de detección automática con bloqueos de control a través de interfaces de mando
- Interfaz web para control, gestión de usuarios, actualización remota, etc.

Puede encontrar los detalles de las funciones en el Manual técnico del usuario CV-LS.

Ámbito

Este manual está diseñado para ofrecer a los usuarios la información técnica necesaria para utilizar la CV-LS. Las unidades descritas en este manual son las siguientes:

- A20980/6000K (fuente de luz blanca fría)
- A20980/3000K (fuente de luz blanca cálida)
- A20980/RGBW (fuente de luz RGBW)

Validez

SCHOTT North America no asumirá responsabilidad alguna por los errores de este manual. Póngase en contacto con nosotros si tiene cualquier sugerencia de mejora, modificación o corrección.

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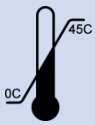
Información de seguridad

Símbolos

Los símbolos empleados en este producto o en el este manual se describen en la tabla siguiente:

Símbolos	Descripción
	Lea el manual antes de utilizar la unidad.
	Precaución: La superficie puede estar caliente.
	Certificado por Intertek. Consulte en el apartado Certification de la página 11 la información sobre conformidad.
	Declaración de Conformidad Europea
	Cumplimiento de RoHS, también conocida como Directiva 2011/65/EU
	Cumplimiento de las Directivas sobre reciclaje de residuos de aparatos eléctricos y electrónicos/restricciones a la utilización de determinadas sustancias peligrosas en aparatos eléctricos y electrónicos (Waste Electrical and Electronics Equipment/Restriction of the Use of Certain Hazardous Substances in Electrical and Electronics Equipment, WEEE/RoHS)
	Rango de temperatura de funcionamiento: 0-45 °C
	Rango de humedad de funcionamiento: 5-95 % sin condensación
	Entrada de alimentación de CC

Documentos relacionados

Título del documento	Número de referencia
Manual técnico del usuario CV-LS	
Hoja de datos CV-LS	

Información de seguridad

Advertencias relacionadas con los productos

Todas las normativas locales de seguridad pertinentes deben cumplirse al instalar y utilizar este producto. Por motivos de seguridad y a fin de garantizar la conformidad con las normas de montaje, únicamente el fabricante está autorizado a reparar los componentes.

PRECAUCIÓN

No mire nunca directamente a la salida LED cuando esté encendida. Los LED tienen una alta luminosidad que puede causar lesiones oculares. No mire a un haz con instrumentos ópticos.
Use gafas de protección ultravioleta (UV) cuando utilice una fuente de luz UV.

PRECAUCIÓN

Los materiales que absorben la luz tienen la capacidad física de convertir la luz incidente en calor. Pueden producirse daños en materiales que absorben luz inflamables o sensibles al calor. Para evitar estos daños térmicos y el posible riesgo de incendios o quemaduras, siga las instrucciones que se indican a continuación:

- No cubra la salida de guía de luz.
- No coloque ninguna parte de su cuerpo en la trayectoria de salida de la luz.
- Cuando ilumine objetos que absorben luz inflamables o sensibles al calor (p. ej., en un microscopio), debe prestarse especial atención para mantener una distancia adecuada entre la guía de luz y el(los) objeto(s). Debe prestarse asimismo especial atención para seleccionar un nivel de brillo adecuado de la bombilla a fin de evitar daños térmicos en el(los) objeto(s).
- Para evitar una presión innecesaria en el tejido biológico debida a la iluminación con luz visible, reduzca el brillo y la duración de la iluminación al nivel mínimo absoluto necesario.
- No cubra las ventilaciones frontal ni trasera cuando utilice la unidad. El flujo de aire no debe estar limitado para permitir la salida íntegra de luz y mantener la vida útil del LED.
- Utilice únicamente cables de alimentación con conectores adecuados para un uso seguro.
- Desconecte la alimentación cuando no se vaya a utilizar la unidad durante periodos de tiempo prolongados.
- No use esta unidad cerca de líquidos ni en zonas con humedad excesiva.
- No coloque materiales inflamables sobre la unidad ni cerca de esta.
- Use únicamente limpiadores de cristal estándar. No use disolventes, destilados del petróleo, ni líquidos o espumas volátiles o inflamables.
- No derrame nunca líquido en la unidad.

- No repare la unidad fuera de lo descrito en este manual. Devuelva la fuente de luz a un centro de servicio autorizado. Para la autorización de devolución de material (Return Material Authorization, RMA), consulte la página 91.

Limpieza

Tanto la carcasa como las placas frontal y posterior tienen un acabado duradero que debería conservar su brillo durante muchos años. Limpiar las áreas expuestas con un limpiador de cristal comercial ayudará a mantener el acabado.

Antes de empezar, quite el cable de la fuente de luz. Limpie las áreas expuestas de la carcasa y las placas frontal y posterior con un paño suave o toallita de papel humedecidos en limpiador de cristal comercial.

PRECAUCIÓN

No use detergentes, agua en exceso, paños tratados, limpiadores agresivos, ni agentes o pulverizadores inflamables. Si se derrama fluido en el interior, deje que la unidad se seque completamente antes de usarla. Cualquier acumulación de polvo visible debe eliminarse periódicamente con una aspiradora o aire comprimido.

Certificaciones

La fuente de luz ColdVision cumple las disposiciones de las siguientes directivas europeas:

- 2014/35/EU (Directiva de baja tensión)
- 2014/30/EU (Directiva CEM)
- 2012/65/EU (RoHS)

El cumplimiento de los sistemas de iluminación de los requisitos básicos establecidos en las directivas mencionadas anteriormente se comprueba mediante documentación técnica de conformidad plena con las normas enumeradas a continuación:

Categoría	Normas
CEM	EN IEC 61326-1:2021 FCC CFR47 Parte 15B: 2015 Diferencias para Japón
Seguridad	CENELEC EN 61010-1:2010/A1 UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1;U3
Fotobiológica	IEC 62471:2006

Información de seguridad

Lugar de montaje

SCHOTT Technologies Mexico, S.A. de C.V.
Carretera México-Veracruz Km.349 Venta Parada,
Amatlán de los Reyes, Veracruz México 94946
Teléfono: +52 (271) 7166-316

Responsabilidades

Cualquier garantía implícita con arreglo a la legislación estatal estará limitada a un año a partir de la fecha de entrega original al comprador original. Quedan excluidos específicamente de la responsabilidad de SCHOTT los daños derivados de actos fortuitos, actos dolosos, vandalismo, disturbios, guerras, instalación inadecuada, negligencia en el funcionamiento o mantenimiento de la unidad, o malinterpretación de las propiedades de la unidad. En ningún caso SCHOTT asumirá responsabilidad alguna por los daños indirectos o de cualquier otro tipo, o bien por las pérdidas o gastos relativos o causados por el uso o incapacidad de usar esta unidad. La declaración de garantía otorga al comprador derechos legales específicos que pueden variar según el estado. Algunos estados, por ejemplo, no admiten la exclusión de los daños indirectos.

Comentarios

Aceptamos sus solicitudes de funciones y comentarios sobre este documento.

Puede ponerse en contacto con nosotros por correo electrónico en la dirección info.microscopy@us.schott.com

Informations de sécurité

Introduction

Lisez attentivement ces instructions et examinez l'équipement afin de vous familiariser avec l'appareil avant utilisation. Les messages spéciaux suivants apparaissant dans ce manuel visent à attirer votre attention sur des dangers potentiels :

ATTENTION

Le message ATTENTION indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, **peut entraîner** des blessures ou des dommages matériels.

Les équipements électriques doivent être installés, exploités, entretenus et réparés exclusivement par du personnel qualifié. SCHOTT North America n'assume aucune responsabilité pour toute conséquence résultant de l'utilisation de cet équipement.

Utilisation appropriée

L'unité ColdVision Light Source (CV-LS) est une source de lumière à LED haute intensité destinée à être utilisée conjointement avec des illuminateurs à fibre optique. Cette source de lumière se caractérise par une sortie de lumière à la pointe de la technologie et une interface utilisateur simplifiée, dotée de capacités de contrôle à distance polyvalentes. L'unité CV-LS est compatible avec tous les guides de lumière de la gamme ColdVision. L'appareil fournit des performances optimales lorsqu'il est couplé à des faisceaux de diamètre plus élevé, de 9 à 14 mm.

Les options suivantes sont actuellement disponibles pour l'unité CV-LS :

- A20980/6000K (Source de lumière blanche froide)
- A20980/3000K (Source de lumière blanche chaude)

Autres configurations disponibles (des quantités et délais de production minimum peuvent s'appliquer) :

- A20980/RGBW (Source de lumière RGBW)
- A20980/400NM (Source de lumière UV 400 nm)

Tous ces modèles sont équipés de sorties de lumière à la pointe de la technologie, le modèle Source de lumière blanche froide dépassant les niveaux des lampes halogènes EJA 150 W. Des solutions émettant d'autres longueurs d'onde, dont des combinaisons des 4 canaux, peuvent être produites afin de répondre aux besoins spécifiques de chaque client.

Informations de sécurité

L'unité CV-LS est dotée de nombreuses fonctionnalités avancées :

- Ports Ethernet, RS-232 et USB (RS-232 virtuel) [rétrocompatibilité avec la source de lumière LLS 3]
- Port Ethernet [interface binaire fiable pour des communications accélérées]
- Commandes analogiques [entrée standard 0 à 5 V]
- Commandes numériques [entrée standard 0 à 24 V]
- Lumière stroboscopique déclenchée ou continue [jusqu'à 10 kHz]
- Temps de montée des impulsions stroboscopiques de 25 microsecondes
- Entrées à détection automatique avec verrouillage des commandes via des interfaces de contrôle
- Interface Web pour le contrôle, la gestion des utilisateurs, la mise à niveau à distance, etc.

Le détail des caractéristiques figure dans le Manuel technique de l'utilisateur CV-LS.

Portée

Ce manuel est destiné à fournir aux utilisateurs les informations techniques nécessaires à l'exploitation de la source de lumière CV-LS. Ce manuel décrit les unités suivantes :

- A20980/6000K (Source de lumière blanche froide)
- A20980/3000K (Source de lumière blanche chaude)
- A20980/RGBW (Source de lumière RGBW)

Validité

SCHOTT North America ne peut en aucun cas être tenue responsable de toute erreur figurant dans le présent manuel. Veuillez nous contacter pour toutes suggestions relatives à l'amélioration, à la modification ou à la correction de ce manuel.

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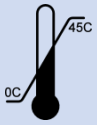
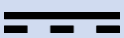
Informations de sécurité

Symboles

Les symboles figurant sur ce produit ou dans ce manuel sont décrits dans le tableau ci-dessous :

Symboles	Description
	Lisez le manuel avant de faire fonctionner l'unité.
	Attention : la surface peut être chaude.
	Certifié par Intertek. Consultez la section Certification à la page 11 pour les informations de conformité.
	Déclaration de conformité européenne
	Conforme à la Directive RoHS, également désignée Directive 2011/65/EU (LSDEEE)
	Conforme aux Directives relatives au recyclage des déchets d'équipements électriques et électroniques (DEEE) et à la limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques (LSDEEE).
	Plage de températures de fonctionnement : 0 °C à 45 °C
	Plage de taux d'humidité de fonctionnement : 5 % à 95 % sans condensation
	Alimentation CC

Documents connexes

Titre du document	Numéro de référence
Manuel technique de l'utilisateur CV-LS	
Fiche technique CV-LS	

Informations de sécurité

Mises en garde relatives au produit

Toutes les réglementations de sécurité locales applicables doivent être respectées lors de l'installation et de l'utilisation de ce produit. Pour des raisons de sécurité et de garantie de conformité aux standards d'assemblage, seul le fabricant est autorisé à réparer les composants du produit.

ATTENTION

Ne regardez jamais directement la sortie des LED lorsque l'appareil est sous tension. Le luminance des LED est extrêmement élevée et peut endommager la vue. Ne regardez pas le faisceau par l'intermédiaire d'instruments optiques.
Portez des lunettes de protection contre les ultraviolets (UV) lors de l'utilisation d'une source de lumière UV.

ATTENTION

Les matériaux qui absorbent la lumière ont la propriété physique de convertir la lumière incidente en chaleur. Les matériaux absorbant la lumière et sensibles à la chaleur ou inflammables peuvent être endommagés. Pour éviter tout dégât thermique et danger potentiel d'incendie ou de brûlure, veuillez respecter les instructions suivantes :

- Ne couvrez jamais la sortie du guide de lumière.
- Ne placez jamais aucune partie de votre corps sur la trajectoire de la sortie de lumière.
- Lorsque des objets absorbant la lumière sensibles à la chaleur ou inflammables sont éclairés (par exemple en microscopie), veillez à conserver une distance appropriée entre le guide de lumière et le ou les objets. Veillez également à choisir un niveau de luminosité de la lampe adapté afin d'éviter tout dégât thermique sur le ou les objets.
- Pour minimiser le risque de réaction indésirable de tissus biologiques due à une exposition à la lumière visible, réduisez la luminosité et la durée d'exposition au minimum absolu.
- Ne couvrez jamais les évents d'aération avant ou arrière lorsque l'unité fonctionne. L'air doit circuler librement afin de permettre une sortie de lumière et une durée de vie des LED optimales.
- Pour des raisons de sécurité, utilisez uniquement des cordons d'alimentation dotés de connecteurs appropriés.
- Débranchez le cordon d'alimentation lorsque l'unité n'est pas utilisée pendant des périodes prolongées.
- N'utilisez pas cette unité à proximité de liquides ou dans un endroit soumis à une humidité excessive.
- Ne placez aucun matériau inflammable sur ou à proximité de l'unité.

- Utilisez exclusivement des produits d'entretien standard. N'utilisez pas de solvants, de distillats de pétrole ou tout liquide ou mousse volatile ou inflammable.
- Ne renversez jamais de liquide sur l'unité.
- N'effectuez pas d'opération d'entretien sur l'unité, autre que celles qui sont décrites dans ce manuel. Retournez la source de lumière à un centre de service agréé. Pour effectuer une demande de retour produit (Return Material Authorization, RMA), consultez la page 91.

Nettoyage

Le boîtier et les faces avant et arrière sont recouverts d'une finition résistante qui préservera l'aspect brillant original de l'unité pendant de nombreuses années. Le nettoyage des parties exposées à l'aide d'un nettoyant à vitres du commerce permet d'entretenir la finition.

Avant de commencer, débranchez le cordon de la source de lumière. Essuyez les parties exposées du boîtier et des faces avant et arrière à l'aide d'un chiffon doux ou d'une serviette en papier humecté(e) avec un nettoyant à vitres du commerce.

ATTENTION

N'utilisez pas de détergents, de grandes quantités d'eau, de chiffons traités, de nettoyants agressifs ou d'agents ou aérosols inflammables. Si un liquide pénètre à l'intérieur de l'unité, laissez cette dernière sécher complètement avant de l'utiliser. Supprimez régulièrement toute accumulation de poussière visible à l'aide d'un aspirateur ou d'une bombe à air comprimé disponible dans le commerce.

Informations de sécurité

Certifications

L'unité ColdVision Light Source est conforme aux dispositions des directives européennes suivantes :

- 2014/35/EU (Directive Basse Tension)
- 2014/30/EU (Directive CEM)
- 2012/65/EU (RoHS)

Le respect des exigences fondamentales relatives aux systèmes d'éclairage définies dans les directives mentionnées ci-dessus est attesté par la documentation technique et entièrement conforme aux normes répertoriées ci-après :

Catégorie	Normes
CEM	EN IEC 61326-1:2021 FCC CFR 47 Partie 15B:2015 Écarts avec le Japon
Sécurité	CENELEC EN 61010-1:2010/A1 UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1;U3
Photobiologique	CEI 62471:2006

Site d'assemblage

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Carretera México-Veracruz Km.349 Venta Parada,
Amatlán de los Reyes, Veracruz México 94946
Téléphone : +52 (271) 7166-316

Informations de sécurité

Responsabilités

Toute garantie implicite accordée en vertu de la législation locale applicable se limite à une année à compter de la date initiale de livraison du produit à l'acquéreur initial. Sont explicitement exclus de la responsabilité de SCHOTT tous les dommages résultants d'actes en rapport avec une quelconque déité, d'actes de nature malveillante, de vandalisme, d'émeutes, de guerres, d'une installation inappropriée, ou de négligence dans le fonctionnement ou la maintenance de l'unité, ou d'une mauvaise compréhension des propriétés de l'unité. SCHOTT ne pourra en aucun cas être tenu responsable de tout dommage indirect ou de tout autre dommage de quelque nature que ce soit, ni des pertes ou des dépenses découlant de l'utilisation, ou de l'incapacité d'utiliser l'unité. La garantie établie fournit à l'acquéreur des droits spécifiques, variables d'une région ou d'un état à l'autre. Dans certaines régions ou états, par exemple, l'exclusion des dommages indirects n'est pas autorisée.

Commentaires

Vos requêtes relatives aux fonctionnalités de l'unité ainsi que vos commentaires sur ce document sont les bienvenus.

Vous pouvez nous contacter par courrier électronique à l'adresse info.microscopy@us.schott.com

安全にお使いいただくために

はじめに

本機をご使用になる前に以下の説明をよく読み、本体をご覧になって、慣れるとともに、安全な使用を心がけるようにしてください。本書を通して、次のようなメッセージがよく出てきますが、これは使用にあたって危険を及ぼす可能性についての注意書きです。

注意

「注意」は、危険な可能性を持つ状況を示し、それを避けることができないと、傷害や機器への損傷につながる可能性があります。

電気設備の設置、操作、サービスおよび保守は、有資格者のみが行うようにしてください。SCHOTT North Americaでは、本機を使用したことによって生じた結果に関しては一切責任を負いません。

想定される使用方法

ColdVision光源 (CV-LS) は、ファイバーケーブルによる照明用の高輝度LED光源です。本光源は、洗練された光出力機能と豊富なリモートコントロール機能を有する簡単なユーザーインターフェースが特徴です。CV-LSは、すべての標準的なColdVisionシリーズ光ガイドと互換性があります。直径のより大きな9-14mmのものと組み合わせることによって、最適な性能を得ることができます。

CV-LSには、以下のようなオプションがあります。

- A20980/6000K (クールホワイト光源)
- A20980/3000K (ウォームホワイト光源)

他にも以下のようなシリーズが用意されています (ご注文時に最小限の個数およびリードタイムが必要になります)。

- A20980/RGBW (RGBW光源)
- A20980/400NM (400NM UV光源)

これらの製品モデルはいずれも業界をリードする光源出力であり、クールホワイト光源モデルは、150W EJAハロゲンランプレベルを上回ります。4チャンネルの組み合わせも含め、他の波長によるソリューションにより、特定のお客様のアプリケーションの要件にも対応が可能です。

安全にお使いいただくために

CV-LSは、以下のような高度な機能を特徴としています。

- イーサネット、RS232、およびUSB (仮想的なRS232) [LLS 3との下位互換性]
- イーサネット [加速している通信用の堅牢なバイナリインターフェース]
- アナログ端子 [0～5V標準入力]
- デジタル端子 [0～24V標準入力]
- トリガーストローブまたは連続ストローブ [最大10KHzまで]
- ストローブパルスで25msの立ち上がり時間
- コマンドインターフェース経由でのコントロールロックアウトによる自動感知入力
- ウェブインターフェースによる制御、ユーザー管理、リモートアップグレードなど。

これらの機能の詳細は、『CV-LSテクニカルユーザーマニュアル』を参照してください。

適用範囲

本書は、CV-LSを操作する上に必要な技術情報をユーザーに提供することを目的としています。本書では、下記の製品を説明しています。

- A20980/6000K (クールホワイト光源)
- A20980/3000K (ウォームホワイト光源)
- A20980/RGBW (RGBW光源)

ご注意

SCHOTT North Americaは、本書内のいかなる誤記にも責任を負うものではありません。本書の改善、変更、あるいは訂正などのご提案があれば、弊社までご連絡ください。

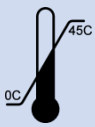
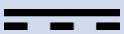
SCHOTT North Americaの事前の許可なく、本書の一部をいかなる形式、手段によっても、複製することはできません。

本書内のデータ、写真、図は、いかなる契約上の債務ともなることはありません。製品の絶え間ない開発の方針上、SCHOTT North Americaは、それに合わせて自社製品を変更する権利を有します。本書内の情報は、事前の予告なく変更することがあります。また、本書の内容がSCHOTT North Americaを拘束することはありません。

安全にお使いいただくために

シンボル

本製品または本書に使用されているシンボルマークについて以下に説明します。

シンボル	説明
	当該ユニットの使用前にマニュアルをお読みください。
	注意：表面が熱くなっている可能性があります。
	Intertekによる認証。コンプライアンス情報に関しては、Certification (ページ11) の項を参照してください。
	EU基準適合を示すCEマーク
	2011/65/EU指令としても知られるRoHSへの適合。
	電気・電子機器廃棄物/有害物質使用制限指令（WEEE/RoHS）に適合
	動作時温度範囲：0℃ - 45℃
	動作時湿度範囲：5% - 95% 結露なし
	DC電源入力

関連文書

文書標題	参照番号
CV-LSテクニカルユーザーマニュアル	
CV-LSデータシート	

製品に関連する警告

本製品の設置時には、各地域に該当するすべての安全規制に準じる必要があります。安全上の理由から、そして、組み立て時の標準への適合を確実にするため、コンポーネントの修理が行えるのはメーカーの有資格者だけです。

注意

LED出力点灯時は、光源を直接見ないようにしてください。LEDは非常に輝度が高いため、眼球を損傷する可能性があります。光学機器の光線を見つめないようにしてください。

UV光源取り扱い時には、紫外線 (UV) からの保護のための眼鏡を着用してください。

注意

光吸収素材には、入射光を熱に変える物理的特性があります。したがって、熱に感応しやすい、可燃性の光吸収素材を損傷させることがあります。したがって、そのような熱的損傷および火災や燃焼の可能性の危険性防止のために、以下の指示を遵守してください。

- 光源ガイドの出口をふさがないでください。
- 光源出力経路上に、自分の身体の一部を乗せないようにしてください。
- 熱に感応する、あるいは、可燃性の光吸収物（顕微鏡検査時など）に照射するときは、光ガイドと対象物の間には、適切な距離を保つように特別な注意を払ってください。対象物に熱的損傷を与えないように適切なランプの明るさレベルを選択するように特別の注意を払ってください。
- 可視光の照射によって生体に不要なストレスを加えることを防ぐために、必要な絶対最小レベルになるように明るさおよび照射時間を減らすようにしてください。
- 本体操作時には、正面および背面の通風孔をふさがないようにしてください。光の出力をフルに行い、LEDの製品寿命を維持するためにも、空気の流れを阻害しないようにしてください。
- 安全な使用のために、適切なコネクターを有する電源コードを使用してください。
- 長期間本機を使用しないときは、電源コードを抜いてください。
- 本機を液体のそば、あるいは、極端に湿気の多いところで使用しないでください。
- 可燃性素材を本体の上、あるいは近くに置かないでください。
- ガラスクリーナーは、標準の製品のみを使用してください。溶剤、石油系抽出液、揮発性液体、可燃性液体、発泡性液体を使用しないでください。
- 本機に液体をこぼさないようにしてください。
- 保守の際、本書に記載されたこと以上の作業を本機に施さないようにしてください。本機を弊社認定のサービスセンターにご送付ください。商品返送認証 (RMA) に関しては、91 ページを参照してください。

清掃

ハウジング部分、正面および背面のプレートには、堅牢な仕上げがされており、長年にわたって、最初の光沢を維持するようになっています。市販のガラスクリーナーで露出部のクリーニングを行うことによって、仕上げ部分を維持することができます。

クリーニング前には、光源から電源コードを取り外してください。ハウジング部分、正面および背面のプレートの露出部分を柔らかい布あるいはペーパータオルを市販のガラスクリーナーで湿らせてから拭き取ってください。

注意

洗剤、過度の水、化学処理した布、表面を傷つけたり、可燃性の清掃製品、スプレーなどは使用しないでください。製品内部に液体をこぼした場合は、本体を完全に乾燥させてから使用するようにしてください。溜まった目に見える埃などは、定期的に圧縮空気入りの缶入りエアダスターなどで除去してください。

認証

ColdVisionの光源は、以下の欧州指令の規程に準拠しています。

- 2014/35/EU (低電圧指令)
- 2014/30/EU (EMC指令)
- 2011/65/EU (RoHS)

上記の指令の基本的な要件に本機の照射システムが準拠している旨は、技術文書で検証されており、下記の規格に全面的に準拠しています。

カテゴリー	規格
EMC	EN IEC 61326-1:2021 FCC CFR47 Part 15B:2015 上記の日本対応版
安全性	CENELEC EN 61010-1:2010/A1 UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1;U3
光生物学	IEC 62471:2006

組み立て地

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補償

州法に定められた補償期間は、元の購入者への最初の納品日から1年に限定されています。特にSCHOTTの補償から免責されるものとしては、不可抗力、悪意のある行為、破壊行為、暴動、戦争、不適切な設置、装置の操作および保守の放棄、装置の特性の誤解に起因する損傷があります。SCHOTTでは、いかなる事情においても、本機の使用理由あるいは操作ができないことによって結果的になんらかの損傷、喪失、あるいは費用の発生が生じても、それらの責任は負いません。補償上の書類に記載された文言によって、購入者は、特定の法的な権利が提供されますが、それは各州によって異なります。例えば、州によっては、派生的損害は免責の対象とはなりません。

コメント

皆様からの機能上のご提案、本書へのコメントを歓迎いたします。

弊社へのお問い合わせは、info.microscopy@us.schott.com へお願いします。

安全信息

引言

开始操作之前，请仔细阅读本说明书，并查看设备，熟悉装置。本手册随处可见以下用于警示潜在危害的特殊信息：



注意

“注意”表示潜在有害的情况，若不加以避免，可能导致人员受伤或设备损坏。

电气设备只能由合格人员进行安装、操作、维修和保养。对于使用本资料引起的任何后果，SCHOTT **北美概不承担任何**责任。

预定用途

ColdVision **光源**（ColdVision Light Source，CV-LS）**是一种高强度** LED **光源，旨在用于光**纤照明设备。这种光源具有最先进的光输出和简化的用户界面，具备多用途遥控能力。CV-LS **与所有**标准 ColdVision **系列**导光板都能兼容。在与直径较大的光纤束（9-14mm）**耦合之后，可达到最佳性能**。

CV-LS **目前可供**应如下选项：

- A20980/6000K（**冷白光源**）
- A20980/3000K（**暖白光源**）

还可提供以下配置（适用起订量和交期）：

- A20980/RGBW（RGBW **光源**）
- A20980/400NM（400NM UV **光源**）

上述所有产品型号均具有行业领先的光输出，并且冷白光源型号的光输出超过了 150W EJA 卤素灯的输出级。可生产其他波长的解决方案（包括 4 **通道**组合），匹配客户的具体应用要求。

CV-LS **具有众多先**进功能，包括：

- **以太网、**RS232 **和** USB（**虚**拟 RS232）[**可以和**较为落后的 LLS 3 **兼容**]

安全信息

- 以太网 [牢固的二进制接口实现更加快速的通讯]
- 模拟控制器 [0-5V 标准输入]
- 数字控制器 [0-24V 标准输入]
- 触发式或连续闪光灯 [可达 10 KHz]
- 25 微秒闪光灯脉冲上升时间
- 自动感应输入，通过指令接口锁定控制器
- 用于进行控制、用户管理、远程升级等操作的网络界面

CV-LS 用户技术手册详细说明了各种功能。

范围

本手册旨在用于提供用户操作 CV-LS 所需的技术信息。本手册中给出说明的装置有：

- A20980/6000K（冷白光源）
- A20980/3000K（暖白光源）
- A20980/RGBW（RGBW 光源）

有效性

SCHOTT 北美不对本手册中的任何错误承担责任。如有任何改善、修改或改正建议，请联系我们。

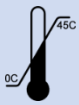
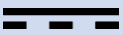
事先未经 SCHOTT 北美授权，不可以任何形式或通过任何方式复制本文件中的任何部分内容。

本文件中的任何数据、照片和插图决不暗示任何种类的合同义务。为了符合我们不断发展的政策，SCHOTT 北美保留修改我们产品的权利。本文件中的信息可发生修改，恕不另行通知，且其内容不应解释为对 SCHOTT 北美具有约束力。

安全信息

标志

下表说明了本产品及本手册采用的标志：

标志	说明
	**操作**该装置前，请阅读本手册。
	**注意**：**表面可能灼**热。
	经过 Intertek 认证。参见Certification**部分**（**第** 11 页），了解合规信息。
	**欧盟符合性声明**
	**通**过 RoHS 认证，该认证亦称为指令 2011/65/EU
	**符合**废弃电子电气设备/电子电气设备中禁用特定有害物质（WEEE/RoHS）**循**环指令。
	**工作温度范**围：0°C – 45°C
	**工作湿度范**围：5% - 95% **不**结露
	DC 电源输入

相关文件

文件标题	参考编号
CV-LS **用**户技术手册	
CV-LS **数据表**	

安全信息

产品相关警告信息

安装和使用本品时，**必**须遵守所有相关本地安全规定。出于安全考量，**并且**为了确保符合组装标准，**只有制造商有**权修理各组件。

注意

切勿直视打开的 LED 输出。**LED 的亮度非常高，可能造成眼部**损伤。不要使用光学仪器观看光束。

使用 UV 光源时，请佩戴紫外线（UV）防护眼镜。

注意

吸光材料具有转化光能为热能的物理特性。可能会对热敏或易燃的吸光材料造成损坏。为避免发生上述热损伤和潜在的火灾或烧伤危险，请遵守如下指示：

- 请勿覆盖光导板的出线口。
- 请勿将身体的任何部位放在光源输出路径上。
- **在**为热敏性或易燃吸光物体（例如，显微镜检查时）提供照明时，必须特别小心，在光导板和物体之间保持适当的距离。还须特别谨慎地选择合适的灯具亮度级，避免对物体造成热损伤。
- 为避免采用可视光源照明生物组织所造成不必要的应变，请将亮度和照明时长削减至所需的绝对最低水平。
- **操作装置**时，请勿遮盖前后通风孔。必须保持气流不受局限，才能实现完全光输出和保持 **LED 的使用寿命。**
- **只使用**带有合适连接器的电源线，保障安全使用。
- 长时间不使用装置时，请断开电源线。
- 请勿在任何液体附近，或在过于潮湿的区域使用本装置。
- 请勿将易燃材料放置在装置上或其附近。
- **只使用**标准玻璃清洁剂。请勿使用溶剂、石油馏分或任何挥发性或易燃液体或泡沫。
- **切勿使液体**喷溅到装置上。
- 维修装置时，切勿超出本手册说明的范围。将光源退回经过授权的维修中心。如需了解退回材料授权（Return Material Authorization，RMA），请参见第 91 页。

安全信息

清洁

机罩和前后护板都具有耐磨漆面，其原有光泽可保持多年。使用日用玻璃清洁剂清洁外露区域有助于保养漆面。

开始之前，请先拔掉光源的电线。使用蘸有日用玻璃清洁剂的柔软布料或纸巾，擦拭机罩和前后护板的外露区域。

注意

请勿使用清洁剂、过多的水、经过处理的布料、腐蚀性清洁或易燃药剂或喷雾。如有流体溅入装置内部，须待装置彻底干燥之后才能再次使用。定期使用吸尘器或日用压缩空气罐，清洁集聚的所有可见灰尘。

证书

ColdVision **光源符合如下欧洲指令的**规定：

- 2014/35/EU（**低**电压指令）
- 2014/30/EU（EMC **指令**）
- 2011/65/EU （RoHS）

采用技术文档确认照明系统遵守上述指令中规定的基本要求，并且完全符合下列标准：

分类	标准
EMC	EN IEC 61326-1:2021 FCC CFR47 第 15B 部分：2015 日本版本
安全	CENELEC EN 61010-1:2010/A1 UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1;U3
光生物学	IEC 62471:2006

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安全信息

责任

州法律暗含的任何保修期都应当从最初交付给最初购买者的日期开始，限定为一年。在 SCHOTT 承担的责任中，应当排除的具体有自然灾害、恶意毁坏、蓄意破坏、暴动、战争、安装不当，或在操作或保养装置时的疏忽，或对装置特性的误解导致的损坏。在任何情况下，SCHOTT 都不应当对因使用或无法使用该装置而造成的，或与之相关的间接或任何其他种类的损坏、损失或费用承担责任。上述保修责任规定了购买者具体的合法权利，在各州之间各不相同。例如，有些州不允许排除间接损坏责任。

意见

欢迎针对本文件提出功能要求和意见。

您可以通过发送电子邮件至 info.microscopy@us.schott.com，与我们取得联系

Light Source Operation

General Operation

The CV-LS has a simplified user interface for easy startup and operation. To use the light source in normal operation, press the Power Switch and adjust the intensity control knob.

The Digital Input pins on the rear Multiport can be used to strobe the LED in 200µs increments. This pin can be controlled with just a contact closure switch between the Digital Input pin and GND pin, or driven low from a digital control pin. The default behavior of this pin is Active Low. When the pin is driven low or connected to GND, the LED will shut down.

More advanced controls over the light source are available through any of the digital interfaces, and are documented in the Technical User Guide (See the Downloads section on page 94).

CAUTION

Because of eye hazards, units outside the visible spectrum require a contact closure on the Digital Input pins of the Multiport to turn the LED on. The user is required to supply sufficient interlocks on this pin to protect the user from exposure to UV and Infrared (IR) light.

Unit Operating Modes

Mode Selection

There are operational modes that can be easily selected by only using the front knob and power button on the unit. These modes allow a simplified use of the unit without the more advanced techniques described in the Technical User Guide (See the Downloads section on page 94). The button on the front of the unit, when held down, has the following sequence:

- 0 to 2 seconds: No Effect (LED ring light will remain in the same state)
- 2 to 6 seconds: Mode Select (LED ring light will flash ten times per second)
- 6 to 10 seconds: Save Current Settings (LED ring light will flash two times per second)
- >10 seconds: Soft Reset (LED ring light will flash one time per second)

The mode selections are different depending on the type of device you have. See the other sections on Single Channel Devices and Quad Channel Devices below.

Save Current Settings

Once you have the state of the device to a point you would like to restore on power up, hold the button for 6 to 10 seconds to “Save Current Settings”. Upon next power up of the unit, it will return to the last saved settings.

Single Channel Devices

Single channel devices, such as the Cool White (A20980/6000K) and Warm White (A20980/3000K), have three operational modes:

- Home (0% knob position): This mode limits the fan to its minimum speed, and the LED output to 70% of maximum. This is the default mode, and can be used in any setting where low noise and vibration from the fan is critical. In this mode, the unit should not be used in an ambient temperature above 25°C. Operating in this mode only, the unit complies with Class B Radiated Emissions limits.
- Industrial (50% knob position): This mode limits the fan to 25% of its maximum speed, but increases light output to 100% of maximum. This mode can be used when more light output is needed, but with slightly higher fan noise and vibration. In this mode, the unit should not be used in an ambient temperature above 25°C.
- Heavy Industrial (100% knob position): This mode allows the fan to run at 100% of its maximum speed, and allows light output to 100% of maximum. This mode offers the most cooling of the LED, and will allow the unit to operate up to its maximum ambient operational temperature of 45°C. It will also extend the life of the LED at cooler ambient temperatures.

Quad Channel Devices

Quad channel devices, such as the RGBW (A20980/RGBW) have six operational modes. The mode descriptions below will be referencing the RGBW units, but can apply to any custom combination of four channels. Channel 1 is selected by default.

- Common Channel (0% knob position): This mode sets a scalar that is applied to all four channels. This mode is used to dim a channel mixture set by the other modes.
- Channel 1 (20% knob position): This mode controls the Red channel and sets its intensity.
- Channel 2 (40% knob position): This mode controls the Green channel and sets its intensity.
- Channel 3 (60% knob position): This mode controls the Blue channel and sets its intensity.
- Channel 4 (80% knob position): This mode controls the White channel and sets its intensity.
- Demo (100% knob position): This mode cycles through every combination of Channels 1-3 (Red, Green, and Blue) to demonstrate all the possible colors that the unit can generate.

Single-Color Control Example

One common use of the RGBW unit is a single color light source, where the user only needs a single color at a time, but may need to change between colors. Use the following sequence to achieve this type of operation:

1. Press and hold the button for more than ten seconds. The LED ring light will be blinking once per second.
2. Release the button to return to factory defaults.
3. Default settings will put the common channel at 100% and the knob will control channel 1 (Red).
4. Press and hold the button for two seconds. The LED ring light will start blinking ten times per second.
5. Once the LED ring light is blinking ten times per second, turn the knob to the desired channel. See the available modes above, IE 40% position for Green.
6. Release the button before six seconds has elapsed. This will change the channel and the corresponding color will turn on. ***Note: If the button was held for more than six seconds, the LED ring light will start blinking two times per second. Releasing the button at this time will only save the current settings, not change the channel.***
7. At this point, the unit will act as a single channel light source of the selected color.
8. You can press and hold the button for six seconds (the LED ring light will be flashing two times per second), then release to store this operating mode.
9. To change to a different color unit, turn the knob to 0% to disable the current channel.
10. Follow steps 4 through 7 to select a new channel.

Multi-Color Control Example

A second common use would be to set a color mix using multiple channels, then dimming the pre-mixed color. Use the following sequence to achieve this type of operation:

1. Follow the instructions to set up the unit for a single color.
2. Set the knob at the intensity for that color to mix with another.
3. Follow steps 4 through 7 of the Single-Color Control Example section above to select a new channel (the first channel should still be active at the intensity you last set).
4. Repeat for as many channels as you would like to mix.
5. Once the target color mix is achieved, set the unit back to the common channel (0% point of the knob) to dim the color with the knob.

Light Source Operation

Unit Mounting

The CV-LS comes pre-installed with four rubber feet on threaded posts. These are suitable for using the unit on a flat surface to provide vibration reduction and keep the unit from slipping. These feet are secured using lightweight thread-locker to keep them from unscrewing during use.

To mount the unit using these threaded holes, the feet can be removed without damaging the unit. It is normal, due to the thread-locker, for removal of the feet to require some amount of force.

Factory Resets

There are two forms of factory resets available. Both can be accessed through different methods.

Soft Reset

The soft reset will restore factory settings to the unit. This can be achieved by first applying power to the unit, then holding the Power Switch for 10 seconds. Upon release, the unit will restore factory settings and reboot. Note: This will also reset network settings.

The soft reset can also be accessed through the digital interfaces and is documented in the Technical User Guide (See the Downloads section on page 94).

Hard Reset

The hard reset will restore factory firmware and factory settings. This can be achieved by first removing power to the unit. While holding the Power Switch, apply power to the unit, and continue holding the Power Switch for five seconds.

The Indicator light will come on for a five-second interval. Release the Power Switch at any time within this interval for the unit to perform a hard reset.

If the Indicator starts flashing twice per second, the five-second interval has elapsed. Go back to the beginning of the Hard Reset section.

Once the Indicator light starts flashing 10 times per second, the unit is restoring the factory firmware. When the Indicator light stops flashing, the hard reset is complete.

Reset Failures

If at any point you have issues restoring the unit to factory settings, see the Return Material Authorization (RMA) section on page 91 for additional instructions.

Software Install

Download the full installer package from the Downloads Page (See the Downloads section on page 94). This install includes:

- CV-LS User Manual (this document)
- CV-LS Data Sheet
- CV-LS Windows USB Driver
- CV-LS 3D Models
- CV-LS Firmware
- CV-LS Dashboard
- CV-LS Dashboard Source Code
- CV-LS Programming Guide

The default install location for these items is:

C:\SCHOTT North America, Inc\CV-LS, ColdVision Light Source\

Note: This location can be changed during the install, but should not be placed in a **System Folder**. Placing these files in a **System Folder** will prevent the application from accessing its settings files.

Software Install

Windows Menu Shortcuts

Once the package is installed, you will find shortcuts in your start menu, as shown in Figure 1 below.

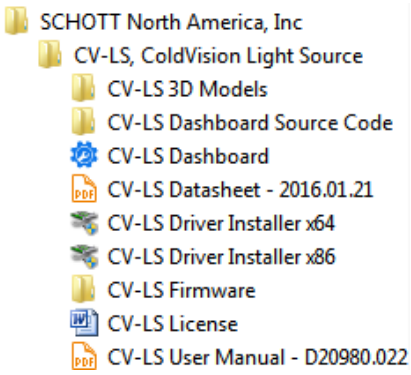


Figure 1: Windows Start Menu Shortcuts

File/Folder Name	Description
CV-LS 3D Models	This folder contains IGES, STEP, and SolidWorks Part Files.
CV-LS Dashboard Source Code	This folder contains the full C# .net source code used to create the CV-LS Dashboard Application. This code is released under the MIT Open Source License. This provides source code the user can reference, or use parts of in their own applications, to quickly interface with the CV-LS units.
CV-LS Dashboard	CV-LS Control Application. This application can fully control the CV-LS units over USB, UART, or Ethernet.
CV-LS Datasheet	Datasheet for the CV-LS product line.
CV-LS Driver Installer (x64, x86)	These applications will install the USB Virtual RS232 drivers into windows. **Administrative Rights Required.**
CV-LS Firmware	This folder contains the firmware file used to upgrade units through the web interface.
CV-LS License	The CV-LS Dashboard is released under the MIT Open Source License - the text of which is contained in this file.
CV-LS User Manual	User Manual for the ColdVision Light Source.

Driver Install

Install the SCHOTT CV-LS Install Package (See the Software Install section on page 49). The driver installers can be accessed from the start menu links, or directly from the install folder. The default location is:

C:\SCHOTT North America, Inc\CV-LS, ColdVision Light Source\CV-LS Driver

This folder contains a simple installer for x86 and x64 architectures, as well as the signed driver files for manual installs. **Administrative Rights** are required to install the drivers.

CV-LS Dashboard

The CV-LS Dashboard Application has many features that can be used to control any CV-LS. Some advanced settings are currently available only through the web interface, which can be launched from the Dashboard.

There are many features built into the Dashboard that are beyond the scope of this manual. Most are self-explanatory, while some may be covered in more detail in Webinars.

Each section of the Dashboard corresponds to a section of the web interface. In the following sections, there will be a screenshot from both the Dashboard and Web Interface. Descriptions of features will indicate from which interfaces they are accessible.

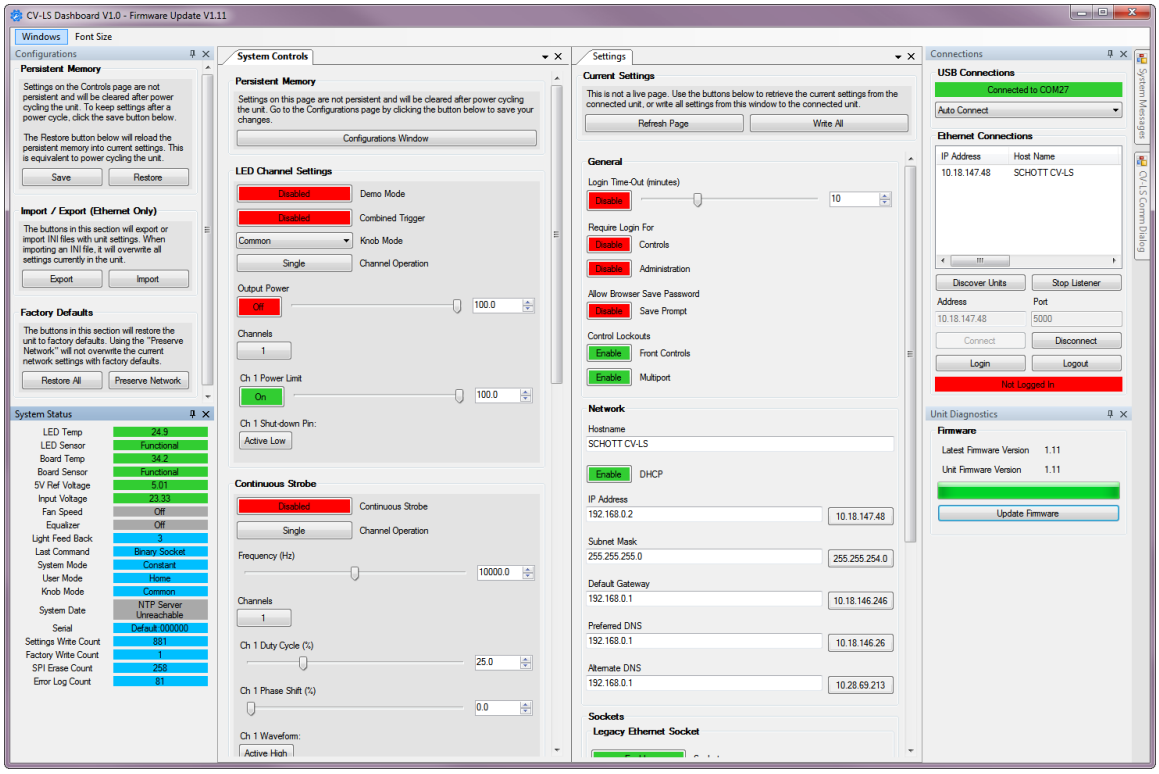


Figure 2: CV-LS Dashboard

All windows in the Dashboard are dock-able. If a window is closed, it can be reopened from the "Windows" menu. Windows can also be undocked from the dashboard into a separate window. Multiple undocked windows can be docked in the same external window. This can be seen in Figure 3 below.

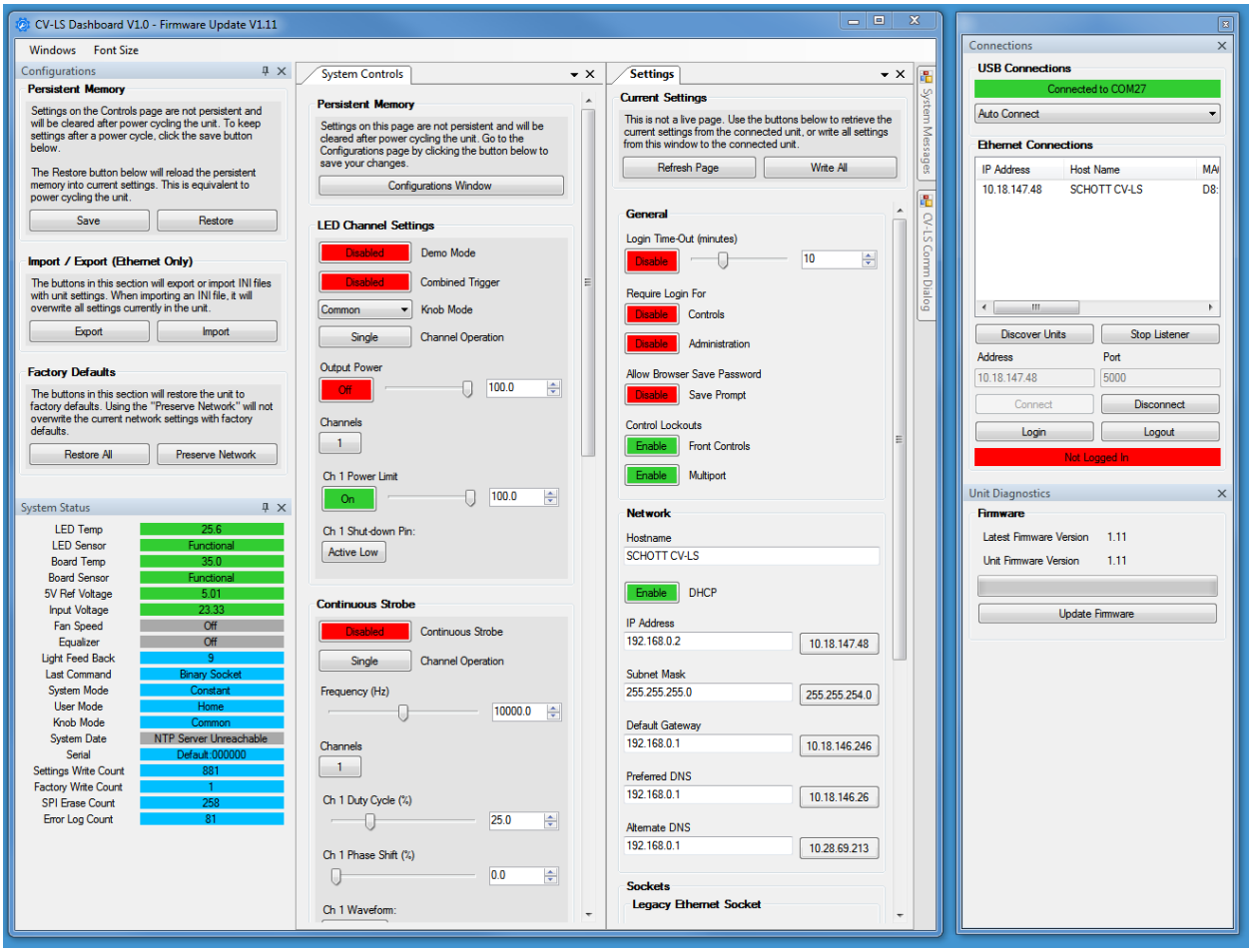


Figure 3: Controls Docked in External Window

Layouts can be saved and restored with options under the “Windows” menu, as well as reset to the default layout. Most window functions are available to all connection types, but some of the more advanced functions are available only over Ethernet connections. Advanced functions include all graphing windows, live system status, firmware upgrade, and INI import/export.

Windows Menu

The Windows Menu allows the user to open windows that are currently closed. This menu also allows the user to save / load / reset the interface.

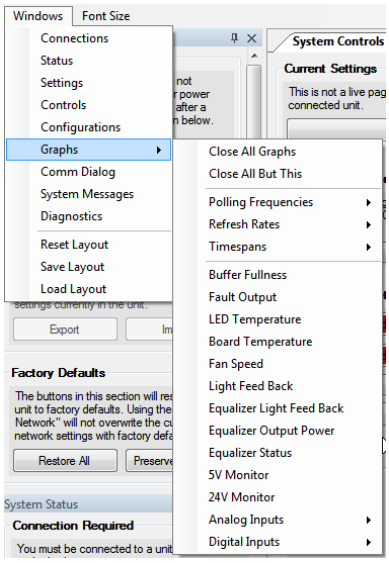


Figure 4: Window Menu

Graphing functions are highly dependent on the speed of the computer being used. The default polling rate of the graphs is 100Hz. This can be increased to 5kHz, but is not recommended unless either a very powerful computer is being used or only a few graphs are being displayed. If the graphs become backlogged with data, the connection will reset.

Note: The graph options under the Windows menu will affect all graphs in the application. You can change the settings of individual graphs by right clicking in the graph.

Color	Description
Connections	Displays the connection options and status for both USB and Ethernet.
Status	Shows the live status of the system.
Settings	ADMIN level login. Contains settings for: Login, Controls Lockout, Network, Socket, and UART.
Controls	USER level login. All LED controls for the system.
Configurations	ADMIN level login. Memory management functions.
Graphs	Contains all graphing windows. Ethernet connections only.
Comm Dialog	Telnet terminal to enter commands manually. For USB connections only.
System Messages	Any output from the Dashboard application the user may need to see for diagnostic purposes.
Diagnostics	Unit firmware upgrade.
Font Size	Allows the user to change the font size of the Dashboard Application.

Connections

The Connections section, which is specific to the Dashboard Application, is shown below in Figure 5. This section is used to connect the Dashboard to units over USB, UART, or Ethernet. If a unit is found on the network, its IP Address can be double-clicked to open the Web Interface for that unit.

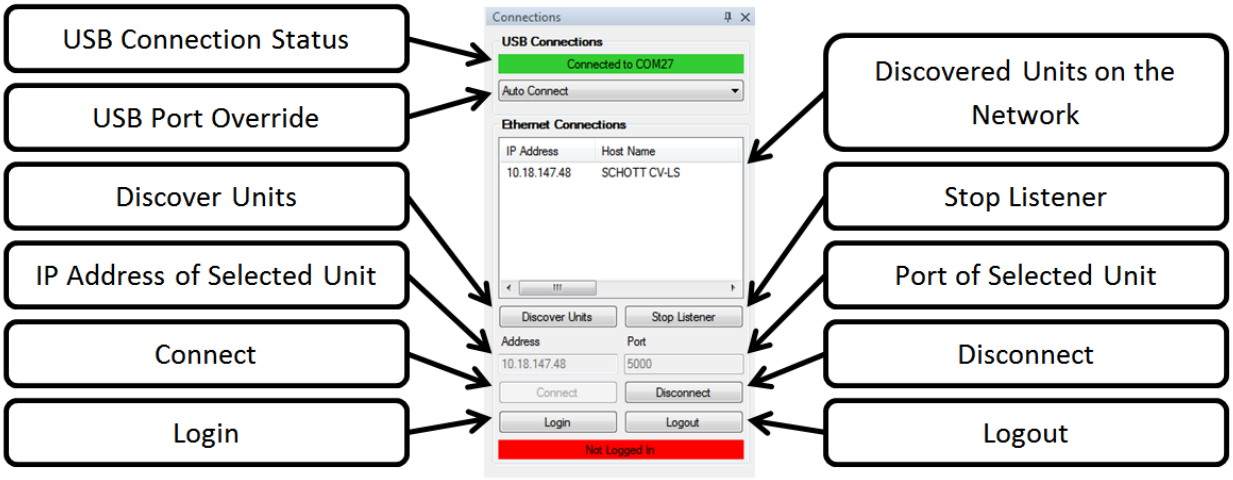


Figure 5: Connections

The Dashboard will automatically connect to the first unit plugged into USB. If a second unit is plugged into the computer, control can be switched to the second unit by changing the "USB Port Override" from "Auto Connect" to the port number of that unit. This method can also be used to connect to a unit over RS232.

The Ethernet Connections section uses a broadcast UDP packet on port 30303. Units on the network may only be listened for by one application on a computer at a time. To connect to multiple units on the network in separate applications, click "Stop Listener" in one application after connecting to a unit. Then, click "Discover Units" in the next window.

Finder Requirements

It is important to note that this method will only work if the following are true:

1) Broadcast UDP packets are allowed
   a) Some networks do not allow this. Check with your IT department to see if this is blocked.
2) Port 30303 is not blocked
   a) Firewalls will block the finder application. You will need either to add an exception to the firewall, or temporarily disable the firewall to discover a unit.
3) Unit and computer have compatible IP addresses.
   a) The default IP settings of the unit are:
      i) IP: 192.168.0.2
      ii) Subnet Mask: 255.255.255.0
      iii) Default Gateway: 192.168.0.1
      iv) DHCP: Enabled
   b) Both the computer and the unit should be on the same network with a DHCP server, or the computer should be set to a static IP like 192.168.0.100.

If all of these steps are followed, and no units are discovered on the network, a USB connection to the unit will display its network settings, which can then be used to diagnose connection issues.

Note: A direct Ethernet connection to a known unit IP address is possible, even if the finder application cannot find the unit on the network.

Once units are found on the network, their IP addresses will be displayed in the Ethernet Connections box. Clicking on the line once will copy the IP address into the “IP Address of Selected Unit” box. Once this is complete, clicking the “Connect” button will connect to the unit. Double-clicking on a line will open the web interface for that unit.

Certain functions of the interface can be locked out, requiring a USER or ADMIN level login. When connecting to a unit by Ethernet, these sections will be hidden with a message that they require a login of a certain level. You can login by clicking the “Login” button. At any time, you can click “Login” again to change the account that is logged in. You can also click “Logout” to logout of the current account. The bottom box will show which account is currently logged in.

System Status

The System Status section shows live information about the unit. Item status is indicated by the following colors:

Color	Description
Green	Normal Operational Status.
Yellow	Warning range. Unit is still operating normally, but is near the Error threshold.
Red	Error Status. LED will not turn on if any errors exist. Fault output line will pull low (GND) if any errors exist.
Blue	Information Status.
Grey	Off status.

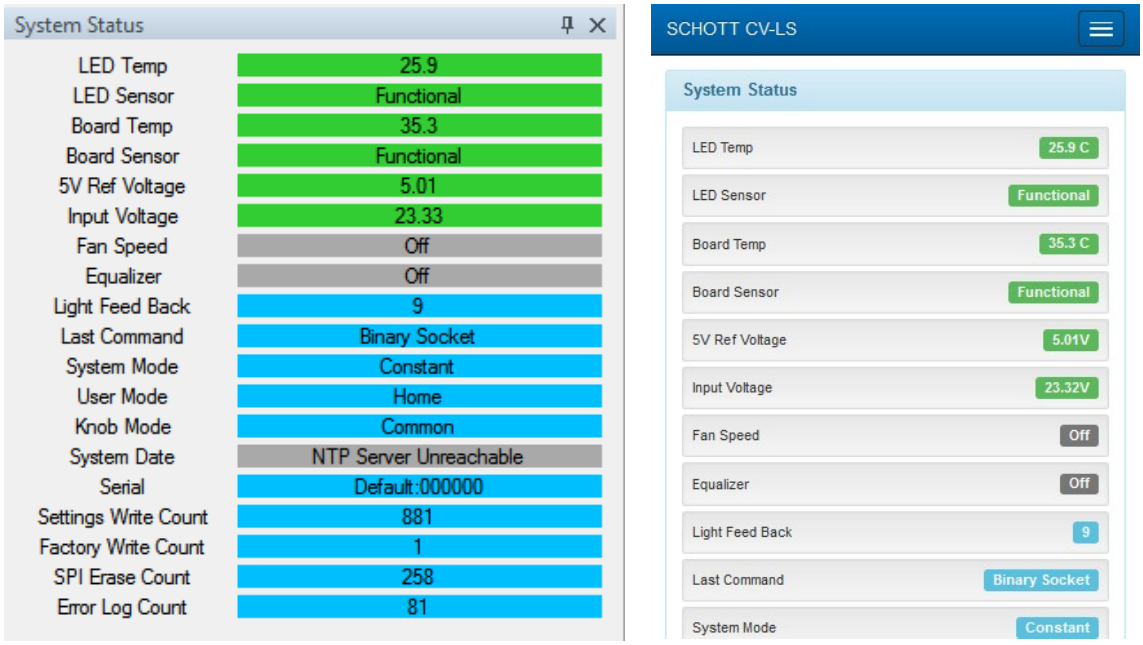


Figure 6: System Status (Left: Dashboard, Right: Web Interface)

CV-LS Dashboard

Control Name	Description
LED Temp	Temperature of the LED. Normal Operational Range: 0 – 80°C Warning Range: 80 – 90°C Thermal Shutdown: 90°C
LED Status	Green when temperature sensor is fully operational. Yellow when temperature is still accurate, but sensor is degraded. Red when temperature is no longer accurate.
Board Temp	Temperature of the LED. Normal Operational Range: 0 – 65°C Warning Range: 65 – 80°C Thermal Shutdown: 80°C
Ref Voltage	5V output voltage measurement.
Input Voltage	Measurement of the current input voltage. Unit will run on 18-28V.
Fan Speed	RPM of the unit fan. Range from 7 – 23K
Equalizer	Status of the equalizer when enabled.
Light Feedback	Current light output value. Value has no units and is not calibrated. Used internally to stabilize output through equalizer functions.
Last Command	Shows the last interface that received input.
System Mode	Currently active unit mode.
User Mode	Last user selected mode.
Knob Mode	Last user selected knob mode.
System Date	When unit has internet access, time will be set from NTP servers.
Serial	Unit model and serial number.
Settings Write Count	Number of times the user has stored settings in the unit. Max value >40e6
Factory Write Count	Number of times the factory has written default settings. Max value >1.6e6
SPI Erase Count	Number of times the unit firmware has been written. Max value > 1e4
Error Log Count	Number of times a system exception has occurred. Max value > 25.6e6

Configurations (ADMIN Level)

The Configurations section is used to modify the unit memory. Current settings can be saved / restored, or reset to factory defaults in this section. All settings can also be stored as a standard format INI file, and imported into other units. These features can be accessed from both the Dashboard, as well as the Web Interface.

Note: Keep in mind that settings changed in the Controls section (page 58) are not persistent until saved in the Configurations section. This allows the user to test new settings without losing those previously saved. Once the settings are saved, the unit will return to those settings upon powering up.

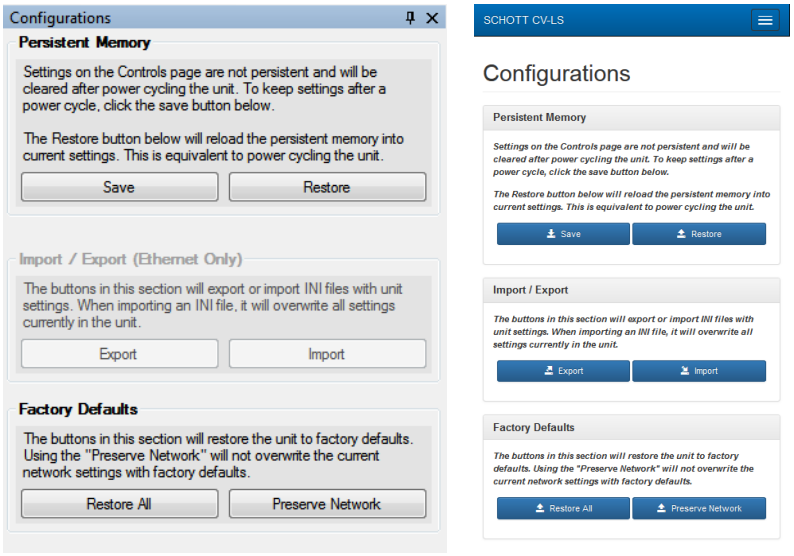


Figure 7: Configurations (Left: Dashboard, Right: Web Interface)

Control Name	Description
Save	Stores the current system settings to memory.
Restore	Restores the last saved settings to the system.
Export	Exports the current settings to an INI file.
Import	Imports an INI file into the current system settings.
Restore All	Restores all factory settings to current memory.
Preserve Network	Restores all factory settings, except network settings, to current memory.

Controls (USER Level)

The Controls section contains all of the settings pertaining to how the LED operates. There are a few differences in how the Dashboard and Web Interface behave. When the Dashboard is only connected via USB or RS232, the Controls page is static. To see the settings currently in the unit, the user must click the "Refresh Page" button at the top of the window.

Note: The "Refresh Page" button will only be shown when the Dashboard is connected to the unit by USB only.

If the Dashboard is connected via Ethernet, or if using the Web Interface, the window is continuously updating itself. For instance, if a user were to change a setting from the Web Interface, those changes would be immediately reflected in the Dashboard.

Note: There is also a message at the top of both the Dashboard and Web Interface, reminding the user that changes on these controls are not "Persistent" - meaning they will not be kept after a power cycle. To keep the changed settings, the user must manually save them from the configurations page.

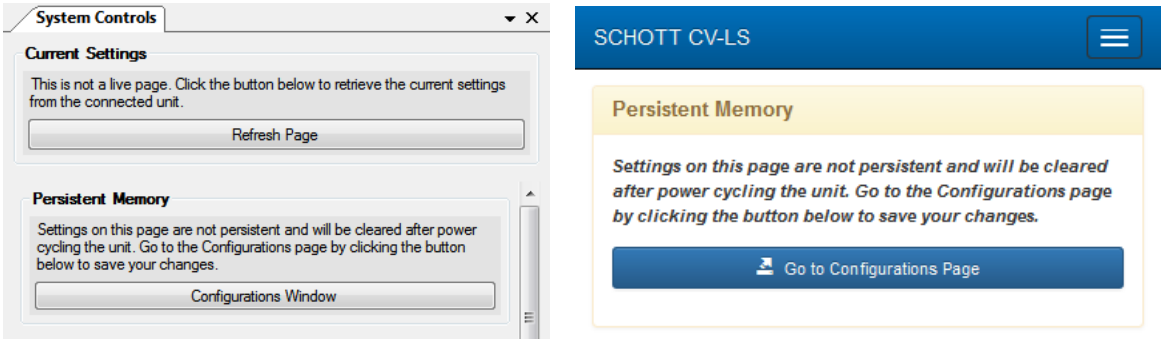


Figure 8: Controls (Left: Dashboard, Right: Web Interface)

All of the advanced operating modes for the LED can be accessed from this section. They are visually broken down into sub-sections within the interfaces. Each sub-section will be explained below.

Note: The CV-LS is a four-channel device. Each channel can be controlled independently of the others. Some of the features in the table below will not be needed in a single channel device.

LED Channel Settings

The LED Channel Settings section controls the basic functionality of the LED. When operating in this mode, the unit behaves as a simple analog dimming light source.

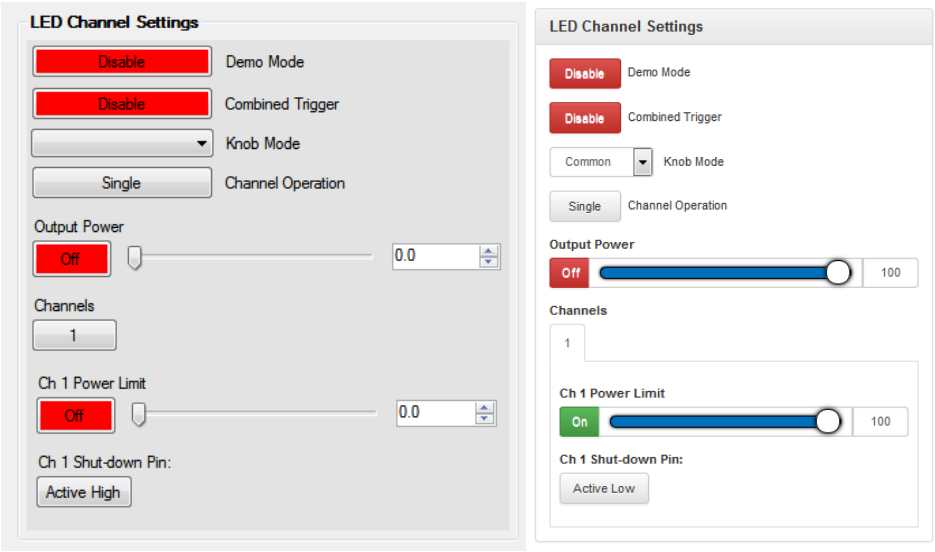


Figure 9: LED Channel Settings (Left: Dashboard, Right: Web Interface)

Control Name	Description
Demo Mode	**Options: Enabled, Disabled** When Demo Mode is enabled, channels 1-3 will cycle through all combinations of intensities. This function is only used for demonstrating the color mixing capabilities of the RGBW model.
Combined Trigger	**Options: Enabled, Disabled** When enabled, a digital input into any channel port is equivalent to applying the same digital signal to all four ports.
Knob Mode	**Options: Common, Channel 1-4, Demo** The front knob of the unit will control either the Common Output Power slider, or the Power Limit slider of the selected channel. Generally used to control the RGBW unit as a single color light source.
Channel Operation	**Options: Single, Quad** When Single is selected, the settings of Channel 1 are applied to all four channels. When Quad is selected, each channel is controlled by the respective settings for that channel.

Control Name	Description
Output Power	**Options: On, Off** This button controls the LED. This must be set to ON before the LED can turn on. When control is set to ON, the LED can still be off by using the shutdown pin on the Multiport connector. **Note:** This setting is also controlled by the button on the front panel of the unit. **Note:** If this setting is ON, but the LED is not coming on, check the individual channel settings.
Output Power Slider and Numeric Up Down	**Range: 0-100.0** This sets the output power of the LED. **Note:** This setting is also controlled by the knob on the front panel of the unit.
Channels	**Options: 1, 2, 3, 4, All** When in Quad mode, all options are displayed to allow the user to show different channel settings. If ALL is selected, then all four-channel settings are displayed at once. **Note:** The following settings, denoted by **Ch X,** are the same for all four channels.
Ch X Power Limit	**Options: On, Off** This button controls the individual channel. This allows the user to turn off an individual channel, even if the Output Power is on.
Ch X Power Limit Slider and Numeric Up Down	**Range: 0-100.0** This sets the power limit of an individual channel. This scaler is applied to the main power setting to calculate the actual power of a channel. **Note:** This setting can be lowered to limit the total output power. This is useful in situations where user control of the front knob is required, but a maximum light output is needed at less than 100%. **Note:** The default setting on single channel units is 75%, to limit temperature of the LED while at minimum fan speed. This can be increased by changing to Industrial or Heavy Industrial mode, as outlined in the Unit Operating Modes section on page 45.
Ch X Shutdown Pin	**Options: Active Low, Active High** This setting controls when the unit will be in shutdown mode based off the input from the multiport. The default is Active Low, so if the Multiport Shutdown Pin is pulled to GND (either driven or with a contact closure), the

	LED channel will not turn on. In a single channel device, a low signal on Channel 1 will turn off the light completely.

Continuous Strobe

In Continuous Strobe mode, the unit will generate a trigger source from its internal clock. This allows the user to set up a continuous strobe train to stop motion in machine vision applications.

Note: Strobe intensity is set by the analog dimming level under the "LED Channel Settings" section.

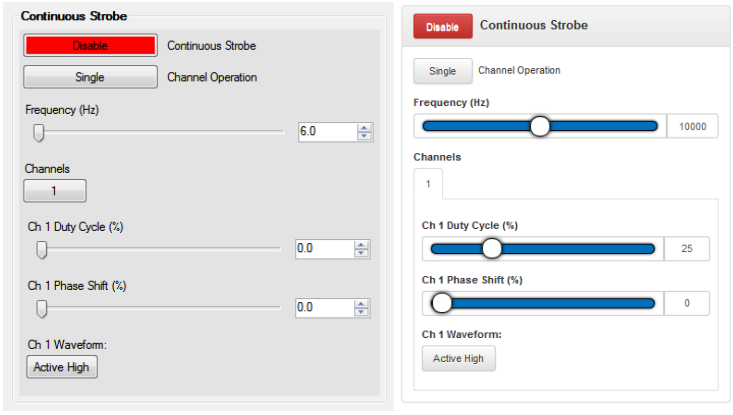


Figure 10: Continuous Strobe (Left: Dashboard, Right: Web Interface)

Control Name	Description
Continuous Strobe	**Options: Enable, Disable** When this option, along with the Output Power, is enabled, the LED will strobe at the settings listed below.
Channel Operation	**Options: Single, Quad** When in Single mode, all four channels strobe with the settings of Channel 1. Quad mode shows settings for each channel individually.
Frequency Slider and Numeric Up Down	**Range: 6 – 20,000 Hz** Frequency of the strobe trigger.
Channels	**Options: 1, 2, 3, 4, All** When in Quad mode, all options are displayed to allow the user to show different channel settings. If ALL is selected, then all four channel settings are displayed at once. **Note:** The following settings, denoted by **Ch X,** are the same for all four channels.
Ch X Duty Cycle (%)	**Range: 0-100.0** Percent of the waveform that is active.
Ch X Phase Shift (%)	**Range: 0-100.0** Percent of the waveform the strobe will wait before becoming active.
Ch X Waveform	**Options: Active High, Active Low**

	Sets the state of the LED during the Active part of the waveform. High = LED On, Low = LED Off.

Below are two samples of Continuous Strobe trains. The LED output is detected on a reverse biased photodiode. In Figure 11 below, because the Waveform is set to “Active High”, the LED is ON for only 25% of the waveform. In Figure 12 below, the Waveform is set to “Active Low”, the LED is OFF for only 25% of the waveform.

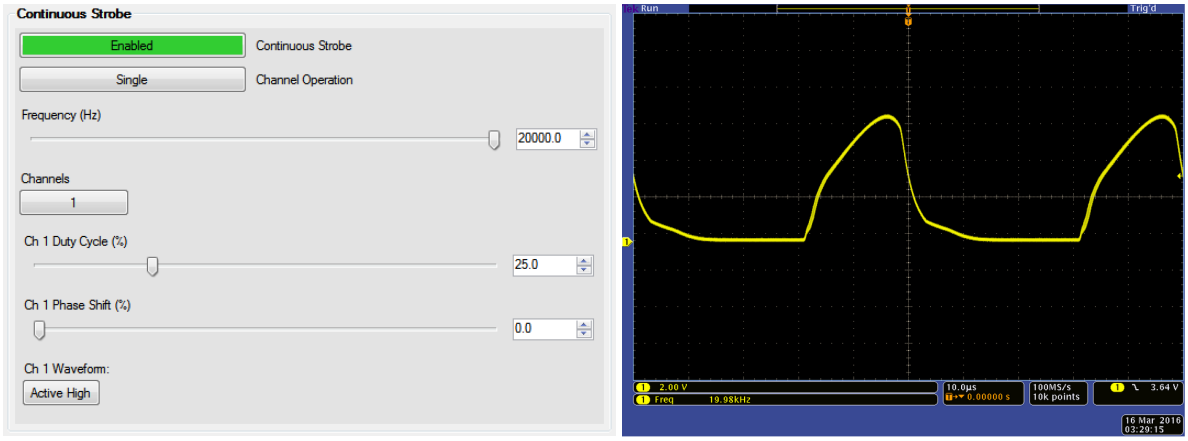


Figure 11: Active High Continuous Strobe Train (Left: Strobe Settings, Right: Light Output measured with Photodiode)

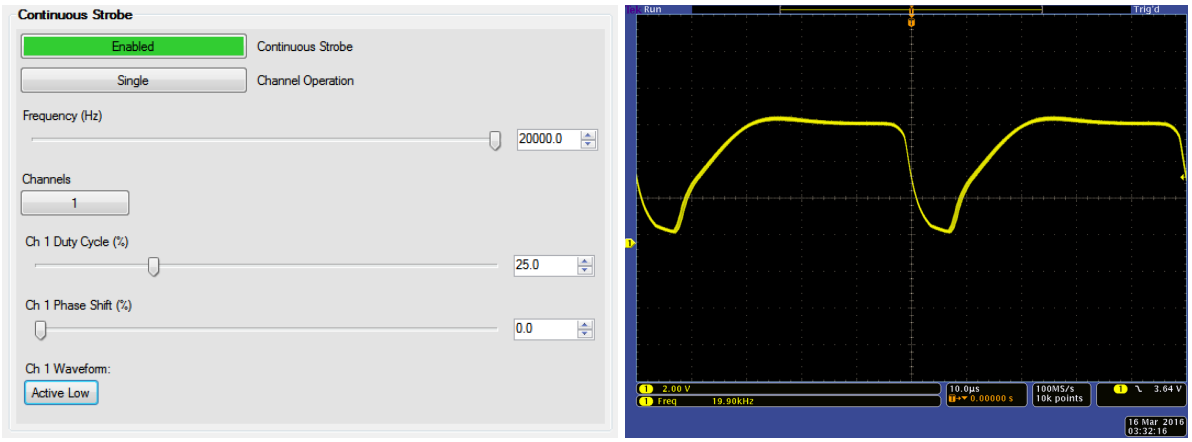


Figure 12: Active Low Continuous Strobe Train (Left: Strobe Settings, Right: Light Output measured with Photodiode)

Triggered Strobe

In Triggered Strobe mode, the unit will wait for a user generated trigger signal on the digital pins of the multiport. This allows the user to set up a strobe train, synced with an external trigger source, to stop motion in machine vision applications.

Note: Strobe intensity is set by the analog dimming level set under “LED Channel Settings” section.

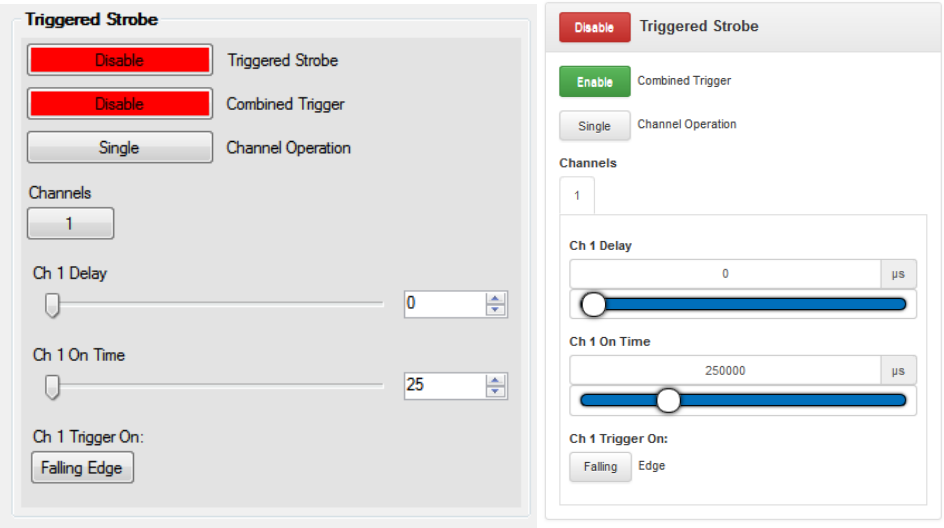


Figure 13: Triggered Strobe (Left: Dashboard, Right: Web Interface)

Below is a sample strobe train. The input is a 20 KHz, 0V Low, 3.3V High signal. The output is detected on a reverse biased photodiode. The spread on the output pulse train is caused by the input signal falling at different times during the 5µs tick of the internal clock used to control the LED.

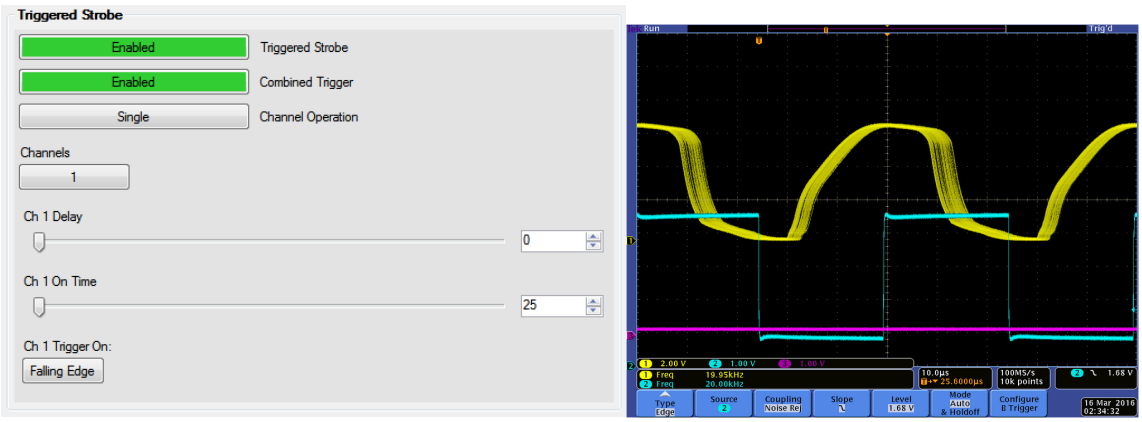


Figure 14: Triggered Strobe Train (Left: Strobe Settings, Right: Oscilloscope trace, Bottom 20 KHz input, Top Light Output measured with Photodiode)

Control Name	Description
Triggered Strobe	**Options: Enable, Disable** When this option, along with the Output Power, is enabled, the LED will strobe at the settings listed below.
Combined Trigger	**Options: Enable, Disable** When this option is enabled, the system will trigger a strobe on all channels when there is a signal on any of the four multi-port digital inputs.
Channel Operation	**Options: Single, Quad** All four channels strobe with the settings of Channel 1 when in Single mode. Quad mode shows settings for each channel individually.
Channels	**Options: 1, 2, 3, 4, All** When in Quad mode, all options are displayed to allow the user to show different channel settings. If ALL is selected, then all four channel settings are displayed at once. **Note:** The following settings, denoted by **Ch X,** are the same for all four channels.
Ch X Delay Slider and Numeric Up Down	**Range: 0 – 1000000µs** Number of microseconds the channel will delay, from when the trigger signal is received, before turning on the LED. **Note:** This setting is in increments of 5µs. You can set a value in increments of 1µs for Legacy Command response, but the system will round down to the nearest 5µs increment. **Note:** There is a 4 – 9µs delay in the response time of the system. This setting adds to that time.
Ch X On Time Slider and Numeric Up Down	**Range: 25 – 1000000µs** Number of microseconds the channel will remain on for the strobe pulse. **Note:** This setting is in increments of 5µs. You can set a value in increments of 1µs for legacy command response, but the system will round down to the nearest 5µs increment.
Ch X Trigger On	**Options: Falling Edge, Rising Edge** Channel will trigger on the falling or rising edge of the input signal, on the digital pin of the multiport, depending on this setting.

Equalizer

The CV-LS Equalizer is a closed loop controller using a small light tap off the led to control the source current and maintain a constant power output. This value is displayed as the “Light Feed Back” (LFB) in the Status section, and “Current Light Output” (CLO) in the Equalizer section. The LFB value is calculated from a much shorter averaging period than the CLO value. The LFB can be used to see a live view of the light output, while the CLO value is used by the internal control loop of the Equalizer.

The basic operating modes of the light source use constant current supply for the LED. This maintains a constant output over time as long as the LED temperature does not change. Age also plays a role, but in LEDs, the timespan is quite long. The LED in the CV-LS is rated for 50,000 hours at an LED temperature of 70°C. This means that at 50,000 hours the LED will still produce 70% of its intensity.

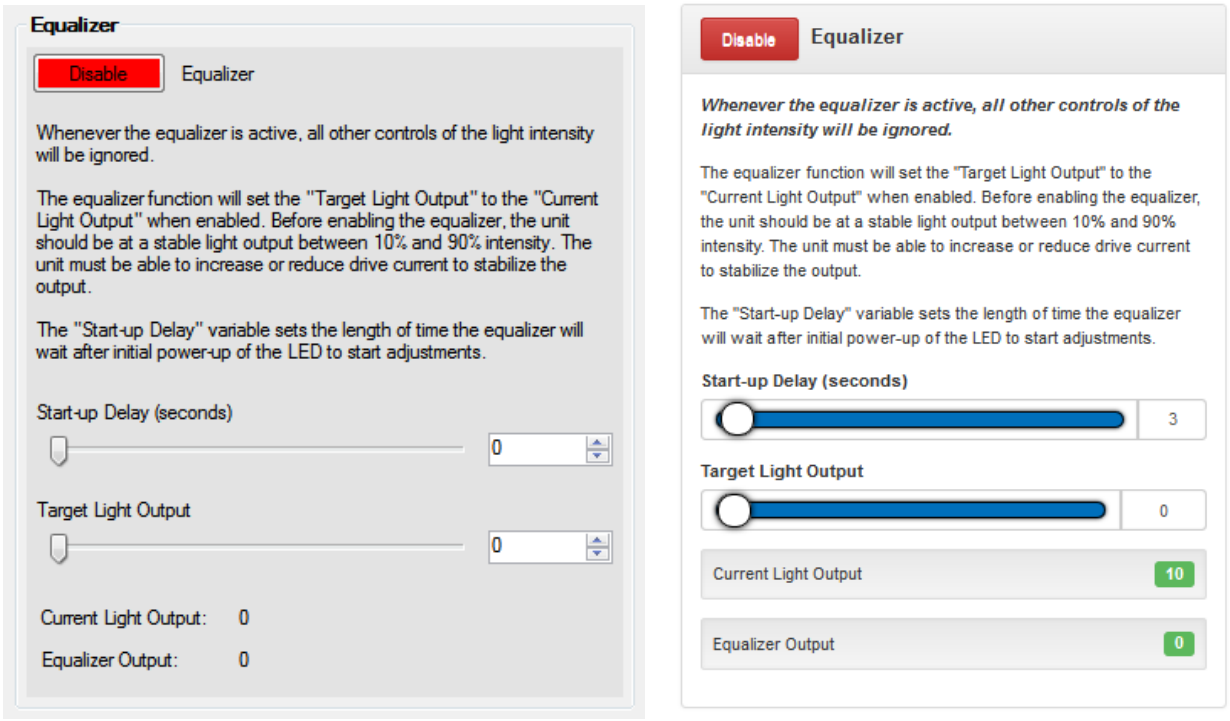


Figure 15: Equalizer (Left: Dashboard, Right: Web Interface)

Equalizer Key Points

Using the equalizer has limitations, which should be understood before using it.

First, the equalizer relies on the CLO, which is averaged over many milliseconds to maintain a steady control loop. Because of this, the equalizer may not perform well if used with strobe modes.

Second, the equalizer needs enough room in the driver to increase or decrease the current with time to maintain the light output. This means if the light is already at 100%, the equalizer cannot increase the current if light output decreases.

Third, because the light output will change significantly when the unit is first turned on, the user should give sufficient time for the light output to stabilize at a satisfactory level before engaging the equalizer. When the equalizer is enabled for the first time, it will set the current light output as its target. This can be manually changed later with the “Target Light Output” controls if needed.

Once the settings are stored, upon future power ups, the unit will return to the set “Target Light Output” value.

The final control in this section is to a time delay. This is a delay, in seconds, after the unit “Output Power” is enabled, before the equalizer will start controlling the output current.

Fan Control

The CV-LS has a variable speed fan to optimize fan noise versus cooling needs. The higher fan speeds allow for operating the LED at max intensity under warmer ambient temperature, but is much louder. The minimum fan speed still allows 70% light output at room temperature and is much quieter.

The user can test the noise of the fan by changing the “Fan Control” from “Auto” to “Manual”. The manual mode will allow for the fan to be on at the speed shown, even if the LED is off. The fan will stay in “Manual” mode for 15 seconds after each speed change, and will then change back to “Auto” mode.

The status windows can be used to monitor the LED temperature to find the optimal tradeoff of fan speed and LED temperature for the intended application.

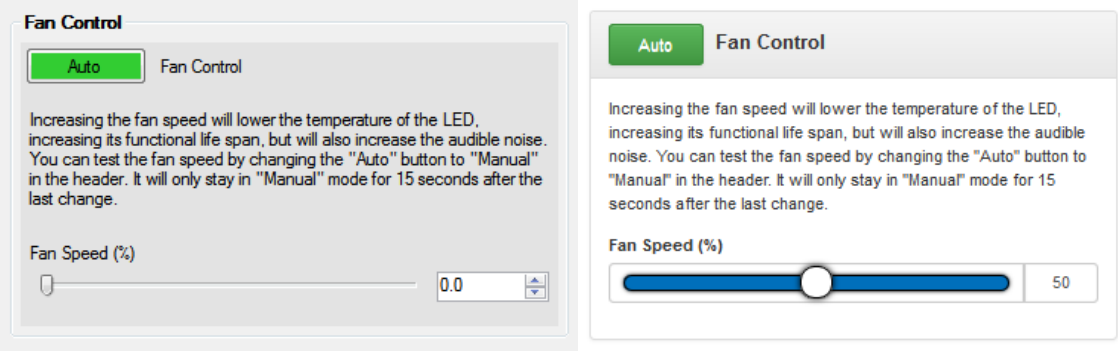


Figure 16: Fan Control (Left: Dashboard, Right: Web Interface)

Upgrade (ADMIN Level)

The Upgrade sections allow the user to update to the latest firmware without sending the unit in under an RMA. Upgrading the firmware will not change any of the unit settings, or disrupt the settings stored at the factory. If upgrading a unit causes any issues, please report the problem to technical support for evaluation.

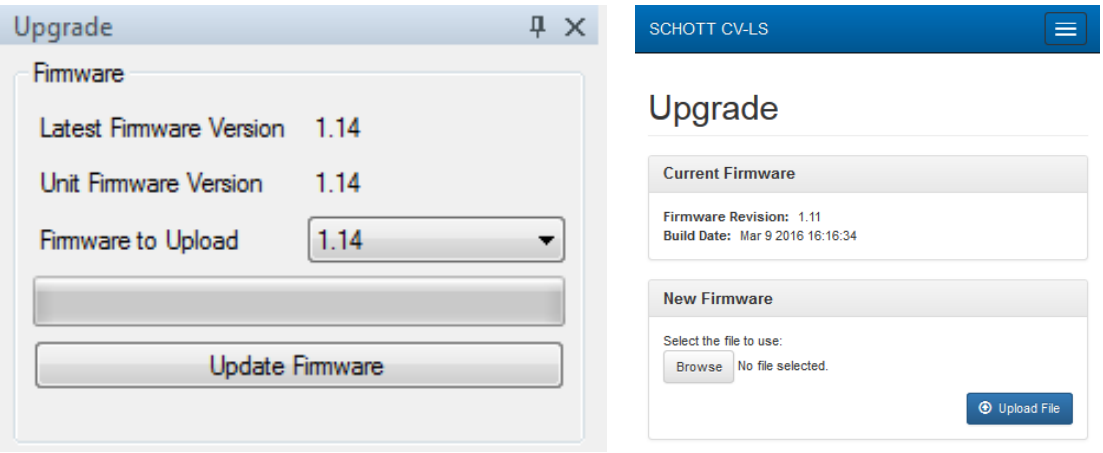


Figure 17: Upgrade (Left: Dashboard, Right: Web Interface)

Control Name	Description
Update Firmware	The "Latest Firmware Version" is the latest firmware built into the Dashboard. The user can select which firmware version to upload by changing the value in the drop list "Firmware to Upload". The user can manually upgrade the connected unit to the selected firmware by clicking the "Update Firmware" button.
Upload File	In the Web Interface, clicking this button will open a file dialog box, allowing the user to select a firmware .bin file to upload to the unit. This can be used to downgrade a firmware if required.

Settings (ADMIN Level)

The Settings section of the controls are static pages on all interfaces. Any changes that are made on this window must be saved to memory before they can be made live before they take effect. This is because the settings on this page require restarting core parts of the processor, and cannot be done without disrupting the connection to the user.

The following sections will describe in detail the controls in each part of the Settings windows.

Note: To save changes, click “Write All“ in the Dashboard, or “Save“ in the Web Interface.

Note: The controls are nested inside tabs in the Web Interface, but are tiled down the page in the Dashboard Window.

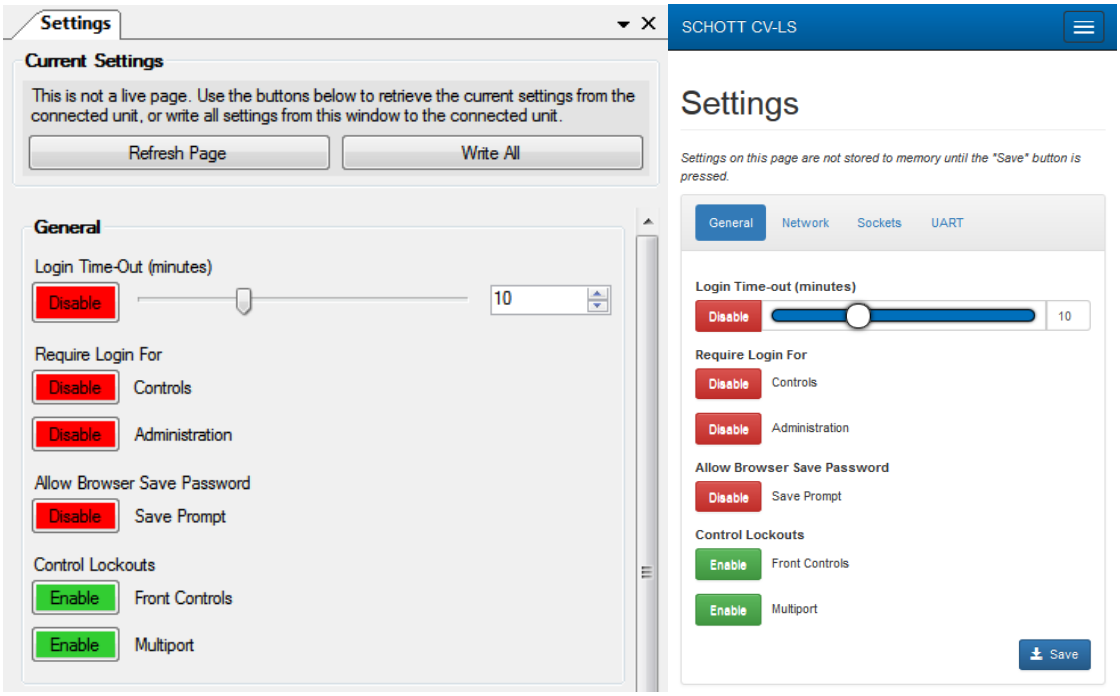


Figure 18: Settings (Left: Dashboard, Right: Web Interface)

General

The General section controls how users log into the device, and which interfaces are active.

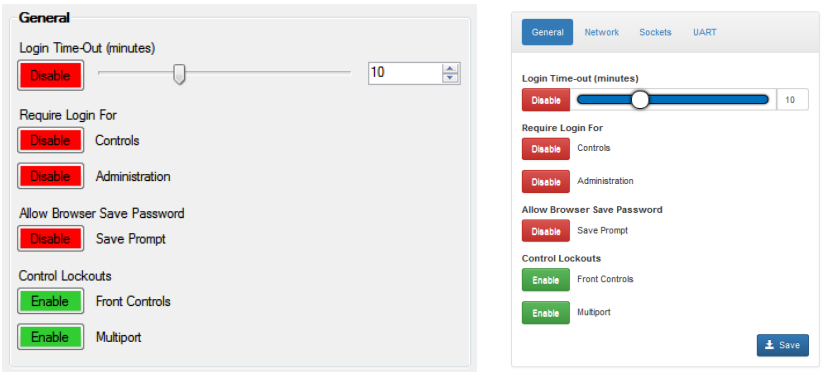


Figure 19: General (Left: Dashboard, Right: Web Interface)

Control Name	Description
Login Time-Out Enable	**Options: Enable, Disable** When enabled, the user will only stay logged in for a pre-set time before the unit will log them out.
Login Time-Out Slider and Numeric Up Down	**Range: 1 – 30 minutes** If logins are enabled, this time is the delay before the user is automatically logged out. Anytime a new page is viewed or a setting is changed, this timeout is renewed to the full time. **Note:** The user can also manually log out using the controls available.
Require Login for Controls	**Options: Enable, Disable** When enabled, the system will require a login of USER level or higher to use USER pages. The Controls page is currently the only page requiring a USER level login.
Require Login for Admin	**Options: Enable, Disable** When enabled, the system will require a login of ADMIN level to use ADMIN pages. In the Web Interface, any pages under the Administration menu require an ADMIN level login. These include: Settings, Configurations, Users, Upgrade, and Diagnostics.
Allow Browser Save Password	**Options: Enable, Disable** When enabled and a user logs into the Web Interface, the browser will prompt to save the password.
Lockout Front Controls	**Options: Enable, Disable** When enabled, the unit will ignore the front button and knob, except when using the front button to performing a factory reset.
Lockout Multiport	**Options: Enable, Disable**

	When enabled, the unit will ignore analog signals to the multiport. Digital signals are still processed.

Network

The Network section allows the user to specify how the unit will connect to a network. By default the units have the following settings:

- Hostname: SCHOTT CV-LS
- DHCP: Enabled
- IP Address: 192.168.0.2
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.0.1
- Primary DNS: 192.168.0.1
- Secondary DNS: 192.168.0.1

This will allow the unit to work without changing these settings on most networks. If these settings are not compatible with your network, it is easiest to change the network settings using the Dashboard connected by USB.

A useful feature of the network pages are the buttons to the right of each field. These buttons display the current network settings, and copy their contents into the field on the left when clicked. This allows you to store the current DHCP settings, and then disable the DHCP to have a static configuration with the values assigned by the DHCP server on your network.

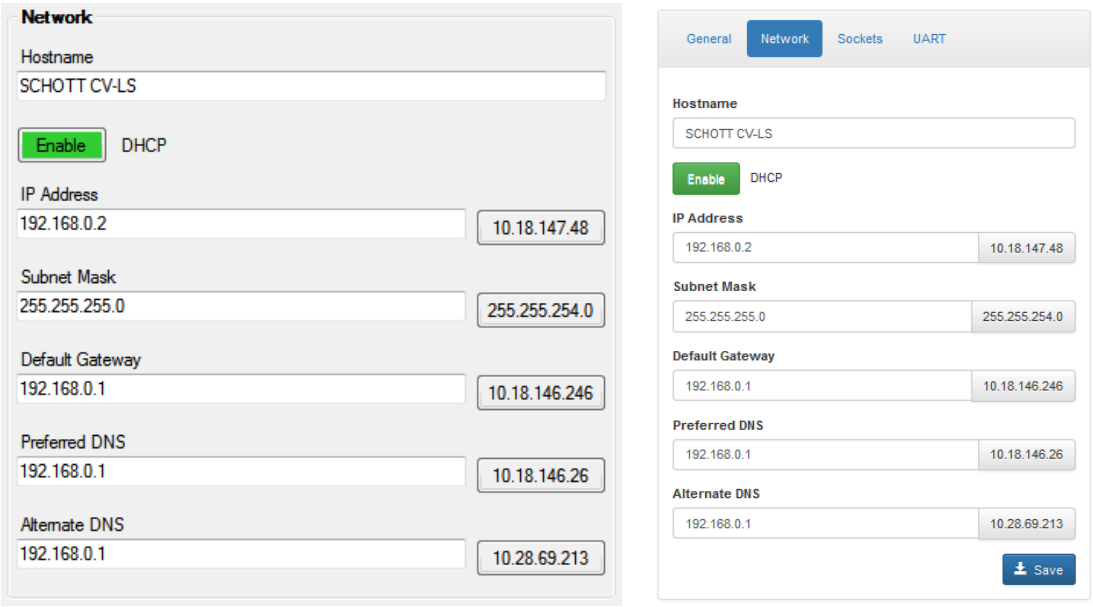


Figure 20: Network (Left: Dashboard, Right: Web Interface)

Control Name	Description
Hostname	The name that will display in the finder application. Used to easily identify multiple units on the same network.
DHCP	**Options: Enable, Disable** When enabled, the unit will first request network information from the local DHCP server. If this fails, it will fall back to the static network information stored in memory. **Note:** The unit will be available more quickly on the network if DCHP is disabled when no DHCP server is present. Otherwise, a timeout must occur before falling back to the static IP in memory.
Text Box Values	The static network values of the system.
Button Text Values	The current DHCP values assigned to the unit. **Note:** These will be 0.0.0.0 if DHCP is disabled.

Sockets

The sockets are used to communicate with the unit over the network programmatically. The Legacy Socket is a standard text based telnet socket, and uses the same command structure as the UART and USB interfaces.

The Binary Ethernet Socket is a new interface based on a binary protocol with packets and error checksums. This interface is much faster and easier to program, and is best used for continuous interaction with the unit.

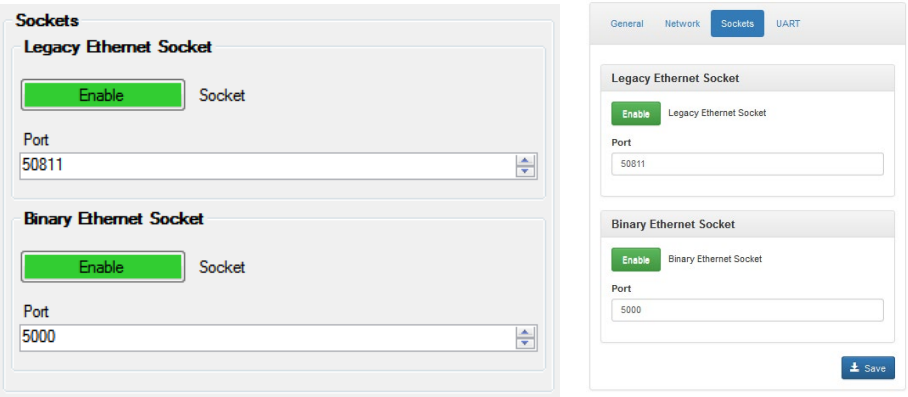


Figure 21: Sockets (Left: Dashboard, Right: Web Interface)

Control Name	Description
Socket	**Options: Enable, Disable** Port is only active when this setting is Enabled. Unit will refuse connections when Disabled.
Port	**Range: 1 - 65,536** The port of one socket must be different than the port of the other socket.

UART

The UART settings allow the user to change the communications protocol of the Legacy UART pins in the Multiport. The default settings are the most common UART port and should only be changed if the user has purposely changed the settings in their command terminal.

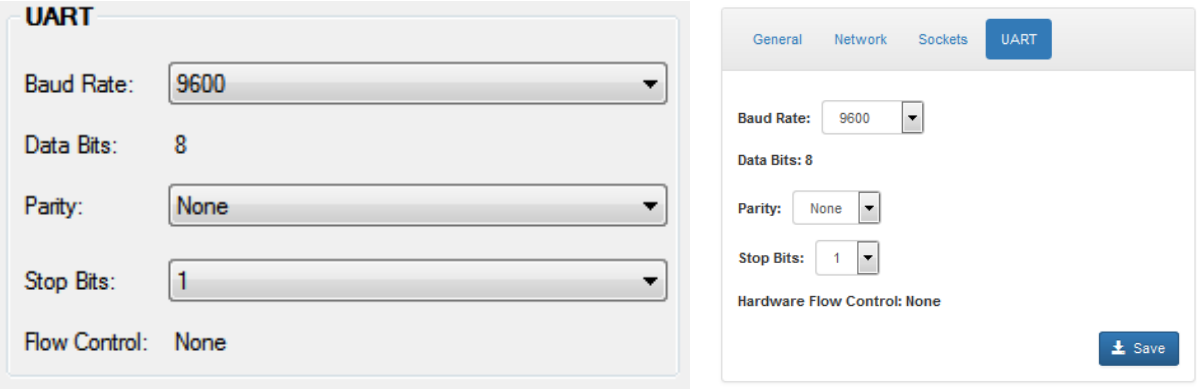


Figure 22: UART (Left: Dashboard, Right: Web Interface)

Control Name	Description
Baud Rate	This is the communications speed. The higher the number, the faster the unit will be able to receive and transmit text. However, not all computers / UART adaptors can run at the highest speed. If you cannot connect at a higher speed, work up to the highest speed your computer can use.
Parity / Stop Bits	These settings rarely need to be changed. They affect the protocol used to transmit characters.

Users (ADMIN Level)

The CV-LS unit comes with two pre-set users, shown in Figure 23 below. Each unit can have up to 10 users.

1) admin
   a) User Name: admin
   b) User Password: admin
   c) Account Level: ADMIN
2) user
   a) User Name: user
   b) User Password: user
   c) Account Level: USER

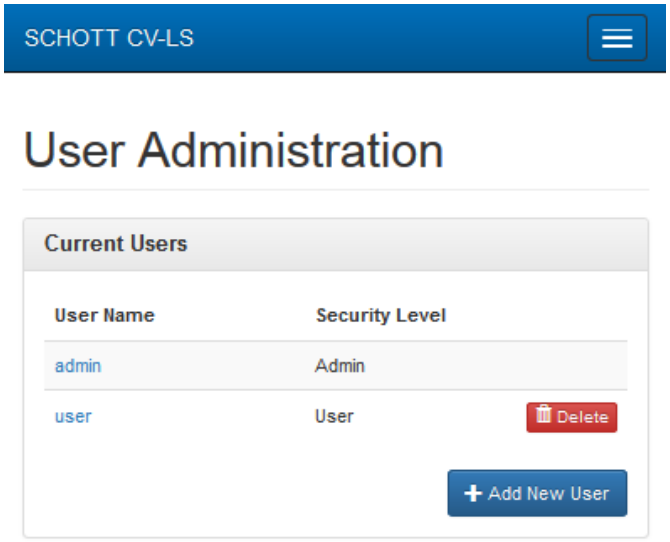


Figure 23: Users

These accounts can be modified as needed for the intended application by clicking on the “User Name” column. There must always be an ADMIN account in the first spot, and this cannot be removed. Any other account can be deleted with the “Delete” button to the right of the user.

New users can be added with the “Add New User” button at the bottom of the screen.

Add / Edit User

When adding or editing a user, different fields are required. If any field is incorrect, a message will be displayed with the error.

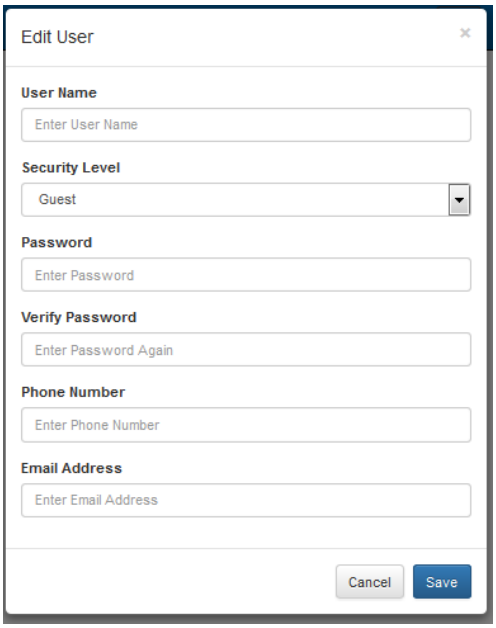


Figure 24: Add / Edit User

Control Name	Description
User Name	**Required For: Add, Edit** This used to log in.
Security Level	**Required For: Add, Edit** This limits what the user can view when logged in.
Password / Verify Password	**Required For: Add** When editing a user, leaving this field blank will keep the old password.
Phone Number	**Required For: None** This field is for a planned firmware upgrade, where software errors / exceptions will cause a notification to be texted to the ADMIN level phone numbers stored in the unit.
Email Address	**Required For: None** This field is for a planned firmware upgrade, where software errors / exceptions will cause a notification to be emailed to the ADMIN level emails stored in the unit.

Delete User

When clicking the “Delete” button to the right of the user, the confirmation dialog shown in Figure 25 below will be displayed. Once the “Delete” button on this dialog is clicked, the user will be deleted and non-retrievable.

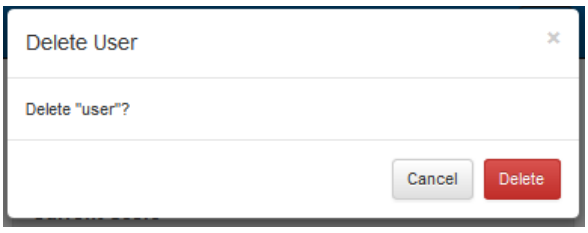


Figure 25: Delete User

Diagnostics (ADMIN Level)

The Diagnostics window is used when something unexplainable is happening to the unit. Information on this page will help technical support diagnose any issues you are having with a unit.

The Logs section has diagnostic information showing where the code was when the exception occurred. This information will allow tech support to track down any bugs in the firmware. The log can be cleared or exported to a text file with the buttons below the table.

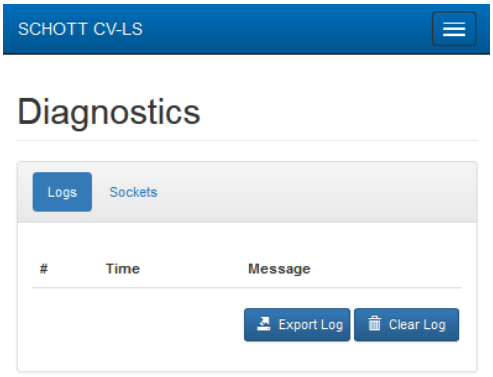


Figure 26: Diagnostics

Sockets

The Sockets tab will show if a computer is currently connected to one of the sockets, and allow an ADMIN level account to kick that computer off the socket. This is useful if someone left the Dashboard connected to a unit remotely and a different user needs to access it. That user can then use the web interface to kick them off the socket, and connect to the socket themselves.

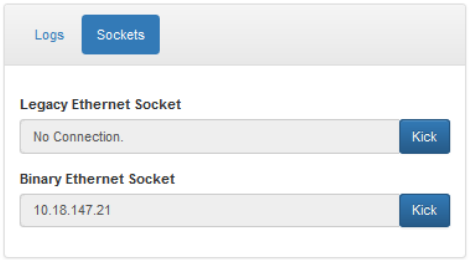
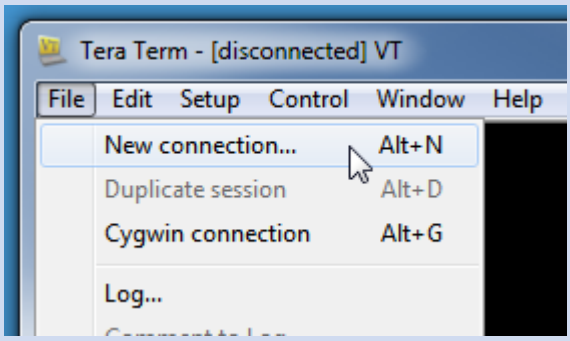
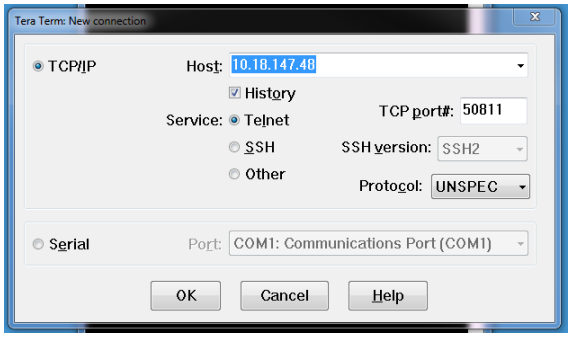
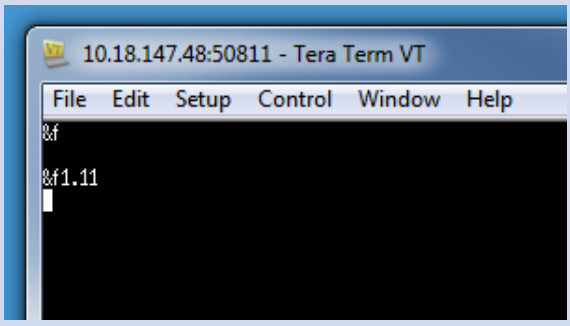


Figure 27: Sockets

Legacy Socket

Socket Connection

The Legacy Socket can be connected to with any telnet type application. TeraTerm is one such application. Once the IP address of the unit is known, follow the steps below to connect to the Legacy Socket in TeraTerm.

Steps	Description
	With TeraTerm open, start a “New Connection”.
	1. Enter the IP address of the unit into the “Host” field. 2. Enter the port for the Legacy Socket into the “TCP port#” field **(Default is 50811)**. 3. Click “OK”.
	The title of the window should change to the IP address and port number entered in the previous step. This means TeraTerm is connected to the socket. Legacy commands can by typed to control the unit. The “&f\r” command is shown here to retrieve the firmware version number (V1.11 in this case).

Legacy Socket

Command Structure

All commands start with the ampersand character “&” and end with a carriage return “\r”. There is a string representing the command immediately after the “&”, followed by the desired value.

The unit will discard all characters until it receives an “&” start character. Once the carriage return “\r” is received, the unit will process the command. If a valid command is not found, the unit will return “&n” followed by the command string with an indicator of which character was not recognized.

Negative Acknowledgements

Negative acknowledgements are used to indicate that a received command was invalid. The following negative acknowledgements are supported:

Invalid Command:	Return string format: &nXpY &n = Negative acknowledgement X = Received characters parsed correctly p = Invalid character location start Y = Invalid character received
Invalid Parameter:	Return string format: &nXpYYY &n = Negative acknowledgement X = Received characters parsed correctly p = Invalid parameter location start YYY = Invalid parameter received

Commands

Please download the programming guide found under the Downloads Section on page 94 for a full list of available commands and how to use them.

Binary Socket

Socket Connection

The Binary Socket can be connected to using custom applications that allow for fast and robust communications. The Dashboard Application uses the binary socket to enable live views and graphing at high speed. The easiest way to start working with the Binary Socket is to look at the source code of the Dashboard Application. This section of the manual describes some of the core functions used for this interface, but is not meant as a sole source of information from which to create an interface.

Note: Example code is copied from the Dashboard source code, and is written in C#.net.

Note: Please reference the source code of the Dashboard Application and the Programming Guide for supplemental information to create your own implementation of the Binary Socket.

Fletcher16 Checksums

The Flecher16 Checksum is used to determine if a packet is corrupted or not. There are many ways to calculate the Flecher16 checksum, but this is the implementation used in the Dashboard Application:

```
// computes the fletcher16 checksum for the data[]
public static byte[] fletcher16(byte[] data, int bytes)
{
    UInt16 sum1 = 0xff, sum2 = 0xff;
    int tlen;
    int i = 0;

    while (bytes > 0)
    {
        tlen = bytes > 20 ? 20 : bytes;
        bytes -= tlen;
        do
        {
            sum2 += sum1 += data[i++];
        } while (--tlen > 0);
        /* First reduction step to reduce sums to 8 bits */
        sum1 = (UInt16)((sum1 & 0xff) + (sum1 >> 8));
        sum2 = (UInt16)((sum2 & 0xff) + (sum2 >> 8));
    }

    /* Second reduction step to reduce sums to 8 bits */
    sum1 = (UInt16)((sum1 & 0xff) + (sum1 >> 8));
    sum2 = (UInt16)((sum2 & 0xff) + (sum2 >> 8));

    return new byte[2] { (byte)sum2, (byte)(sum1) };
}
```

Binary Socket

Encoding a Packet

All binary commands have the following key Byte Values:

Byte Name	Value
Start	0x12
Escape	0x7D
End	0x13

A command has the following structure:

1) 2 Byte Command
   a) Bits 1-12: Command Code
   b) Bit 13: Read when 0, Write when 1
   c) Bits 14-15: Command Set
2) 2 Byte Data Length (number of bytes in Data Payload)
3) Data Payload
4) 2 Byte Flecher16 Checksum

Once the command is constructed, the data must be escaped. Any byte in the entire packet that matches the **Start**, **Escape**, or **End** bytes must have the **Escape** byte added just before it. The byte must then have a bitwise XOR with 0x80 applied. This ensures that no byte in the entire payload will match the **Start** or **End** bytes.

Once the command is escaped, a **Start** byte is prepended to the packet and a **Stop** byte is appended to the packet.

This process creates a single complete packet that can be transmitted to the Binary Socket. If a packet does not follow this form, it will be discarded by the unit.

Note: An example implementation of this method can be found in the "classBinarySocket.c" file in the Dashboard source code.

Decoding a Packet

Decoding a stream of data from the unit can be done by reversing the process of "Encoding a Packet". The Dashboard Application implements an asynchronous approach to decoding packets. This is the preferred method to make use of the streaming status functions available to the Binary Socket.

Commands

Please download the programming guide found under the Downloads Section on page 94 for a full list of available commands and how to use them.

Product Specification

Environment

Operational Temperature

For indoor use only!
CV-LS: 0°C to 45°C.
Power Supply: -30°C to 50°C.
Altitude 0 – 2000m
Pollution degree 2

There are temperature sensors on the LED module and PCB. Readings are accessible through software interfaces. Software controls will not allow the LED to be driven over its maximum operating temperature and will automatically dim the LED to prevent damage.

Storage Temperature

CV-LS: -25°C to 85°C
Power Supply: -40°C to 85°C

Humidity

CV-LS: 5% to 95% Non-Condensing
Power Supply: 20% to 90% Non-Condensing

Electrical

Input

CV-LS: 18-28VDC / 5A Max
Power Supply: 85 – 264 VAC, 47 – 63 Hz, 120W
Overvoltage Category II

CAUTION

The CV-LS must have an Earth Ground connection for EMC Compliance.

Users must adhere to one of the following:

- Use the included AC/DC power supply. Third prong must be connected to Earth Ground.
- One of the GND pins in the Multiport Connector must be connected to Earth Ground.

Redundant Power Inputs

The CV-LS can be powered through either the Multiport terminal block or the DC Power Input. Both of these inputs are isolated from the other through a load sharing circuit built into the CV-LS. This means

the user can supply power through both interfaces without damaging either supply, allowing for redundant supply inputs.

Mechanical

Weight (Typical)

CV-LS: 1.8 lbs
Power Supply: 1.7 lbs
Packing Materials: 1 lbs
Total Shipping Weight: 4.5 lbs

Physical Dimensions (Inches)

The following diagram shows the physical dimensions of the CV-LS.

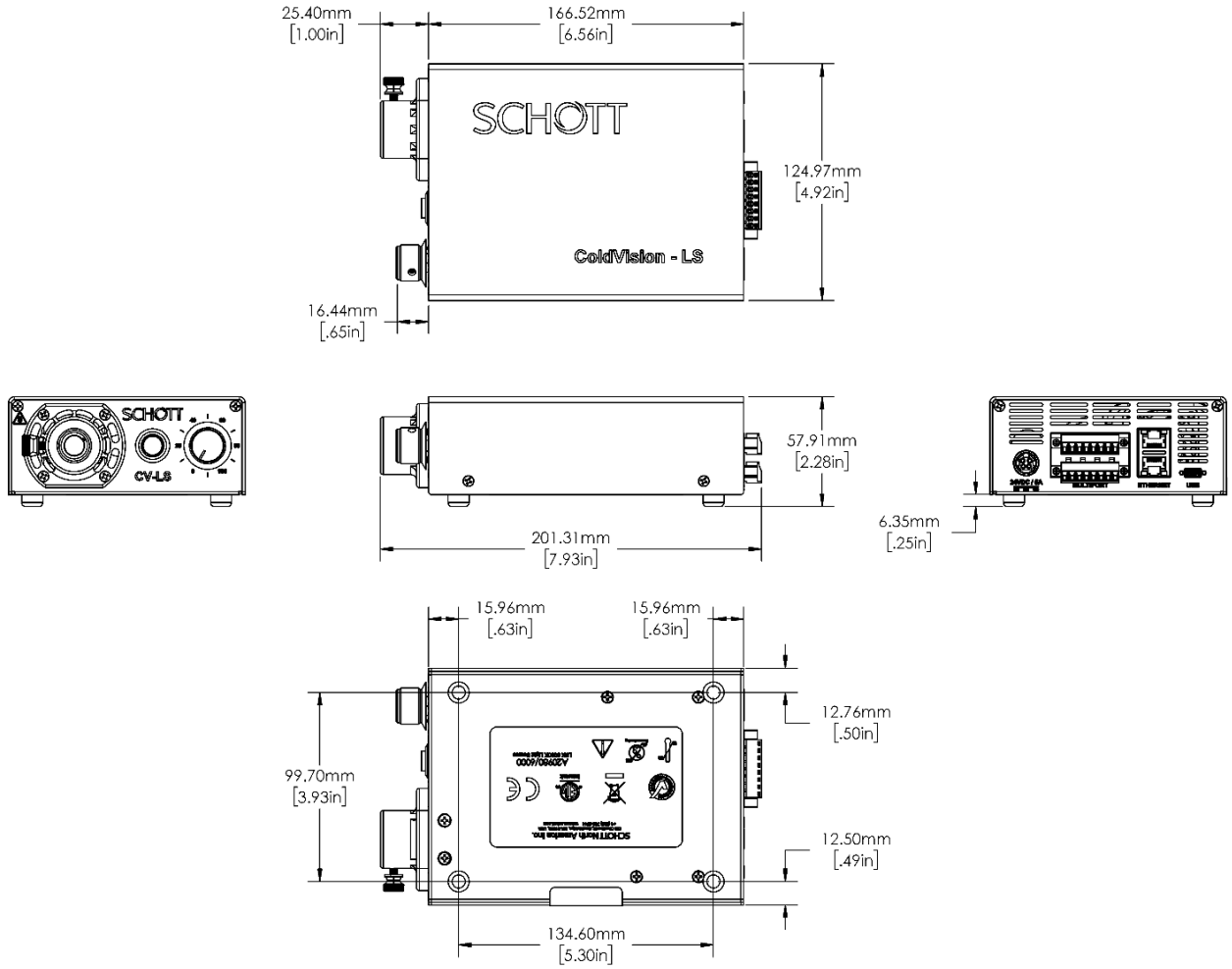


Figure 28: CV-LS Dimensions

Front Panel Description

The front of the unit is where the manual controls for use by an operator exist. This is also the exit point for the light, as well as the ventilation direction for air exiting the LED heat sink. These vents should never be impeded, as it may result in reduced light output.

CAUTION

The nose cone and surrounding area may become hot at high light output. Under certain user settings, these surfaces may become hot enough to burn the operator. Always handle these surfaces accordingly.



Figure 29: CV-LS Front Panel Description

Label	Description
Vent Outputs	Heated air from the LED will vent out of these slots. They must remain unobstructed to maintain full light output.
Fiber Optic Thumb Screw	This thumbscrew is used to retain fiber optic cables inserted into the nose cone.
Output Control Knob	This knob allows for overall adjustment of the LED light output.
Power Switch / Indicator	This switch can be used to enable/disable the LED on the unit. The LED indicator ring will turn on when the LED is enabled, or flash if there is an error with the unit.

Rear Panel Description

The back of the unit is where power is supplied, all remote control interfaces are connected, and the air intake vents for LED cooling are located. All ports on the back of this unit are locking connectors for industrial use.

CAUTION

The vent slots on the rear panel supply air to cool the LED. Ensure adequate airflow to vents at all times.

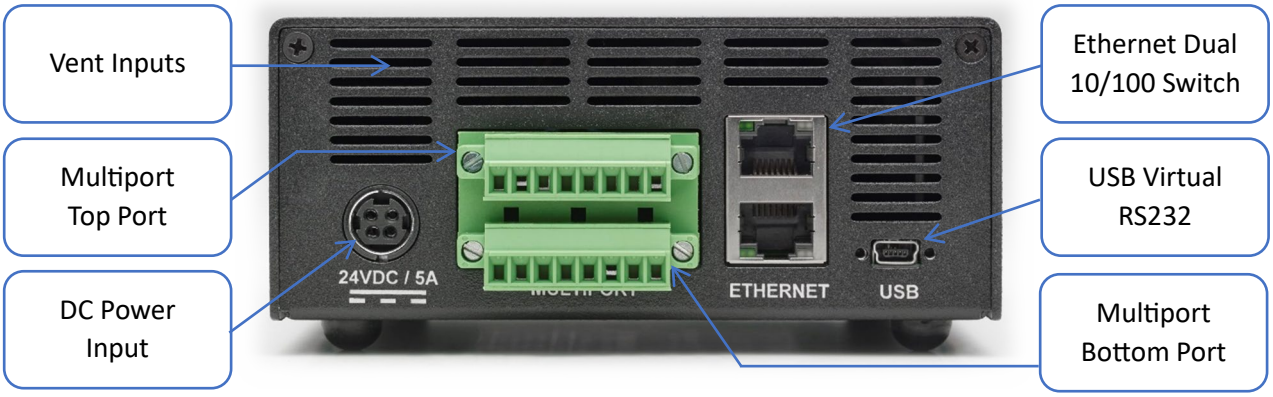


Figure 30: CV-LS Rear Panel Description

Label	Description
Vent Inputs	Air is pulled into these vents to cool the LED.
DC Power Input	The included AC/DC power supply will plug into this locking connector.
Ethernet Dual 10/100 Switch	The dual Ethernet port is a built in 10/100 Ethernet Switch. Either port can be used to connect the unit to a network. The second port can be used to chain units off the same network port.
USB Virtual RS232	This port will be detected as a RS232 port and can be used in any software that would normally connect to RS232. (See the Downloads section on page 94)
Multiport Top Port	This connector contains CH 2 to CH 4 analog and digital inputs, as well as the native RS232 TX and RX pins.
Multiport Bottom Port	This connector contains CH 1 analog and digital inputs, fault output, DC power input, 5V output, and GND connections.

Multiport Pin Details

CAUTION

All wiring to the Multiport terminal block signal lines must be rated to 30V/200mA. The +24V and GND wiring must be rated for at least 50V/5A. The temperature rating of all wiring should be greater than 70°C. The Multiport terminal block is rated for 16-28 AWG solid or stranded wire.

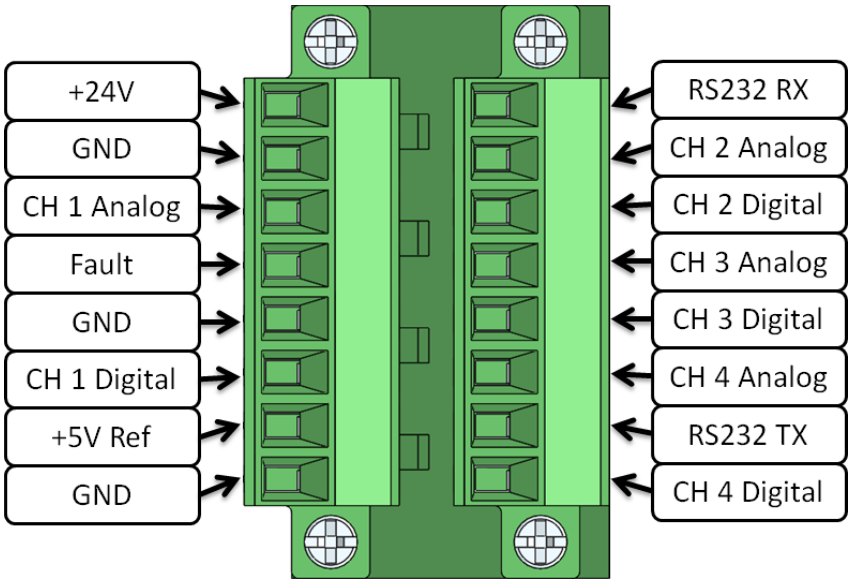
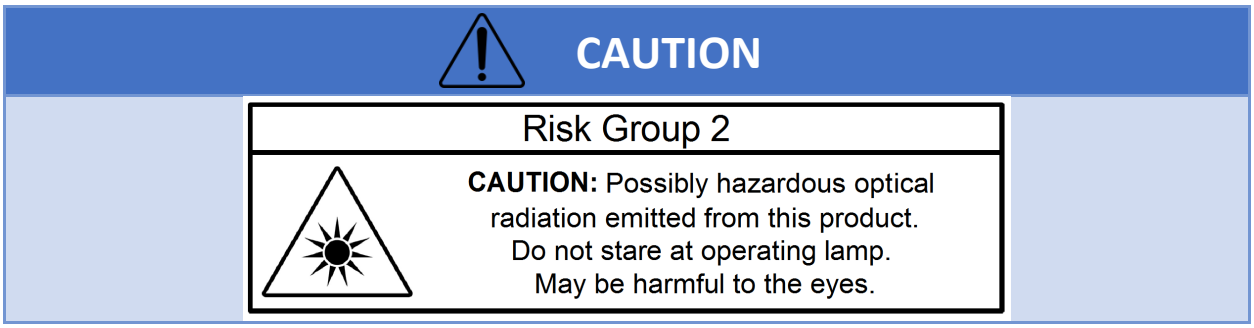


Figure 31: CV-LS Multiport Description

Name	Voltage Range	Notes
+24V	18V to 28V	Power connection must be a low impedance source. Current ramp rate can be as much as 4A in 25µs.
GND	Earth Ground	When powering the unit through the multiport, at least one GND pin should be connected to Earth Ground through a low impedance path.
CH X Analog	0V to 5V	Controls the intensity of the LED channels.
CH X Digital	0V to 24V (3.3V TTL, 24V Max)	Pin is pulled up internally; a contact closure can be used to create a low signal. <0.5V = Low
Fault	Open Collector (24V Max)	Active Low: Signal will be pulled low (GND) when a fault exists.
+5V Ref	5V Output Reference	Voltage rail can be used to power potentiometers for analog inputs.
RS232 RX	-30V to +30V	Data input to the device.
RS232 TX	-5V to +5V	Data output from the device.

LED Information



Light output is measured using a SCHOTT fiber optic light guide, Ø 13 mm active, length 1 m (A08051.40 bundle).

LED Light Output will vary slightly with LED temperature. Please allow time for the temperature to equalize to achieve stable light output. This can take several minutes at maximum fan speed settings.

LED output is through the front nosepiece of the unit. Please follow all safety and operational guidelines to ensure safe operation of the unit.

A20980/6000K

Typical Output: 1300 lumens.

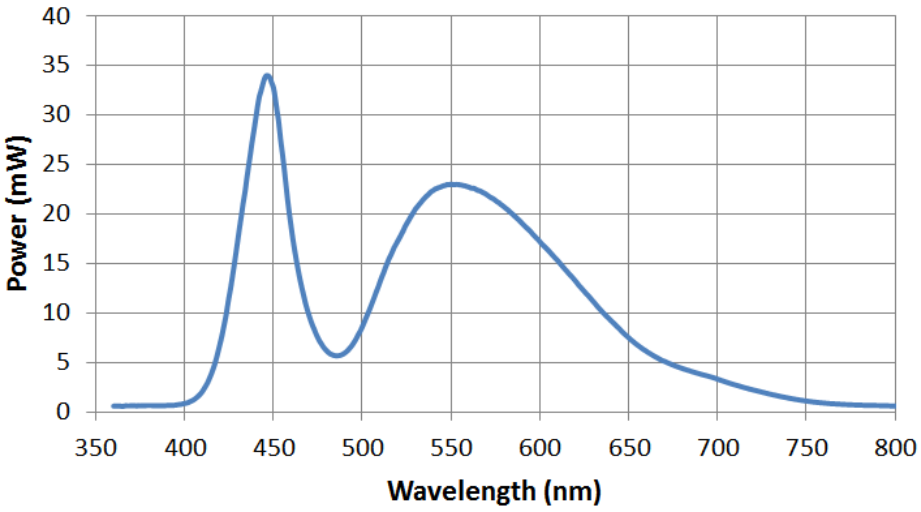


Figure 32: Typical relative spectral power vs wavelength (6000K model)

A20980/3000K

Typical Output: 900 lumens.

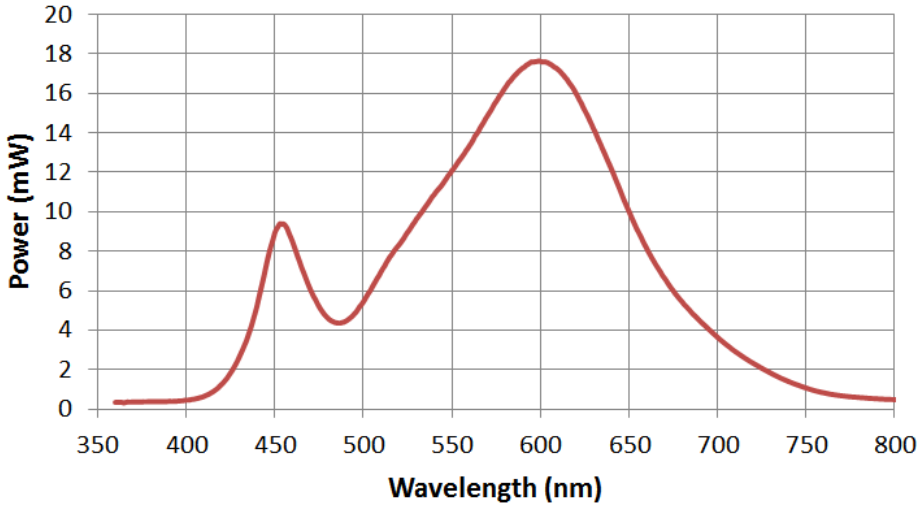


Figure 33: Typical relative spectral power vs wavelength (3000K model)

A20980/RGBW

Typical Output: 130 lumens (Red), 250 lumens (Green), 70 lumens (Blue), 400 lumens (White).

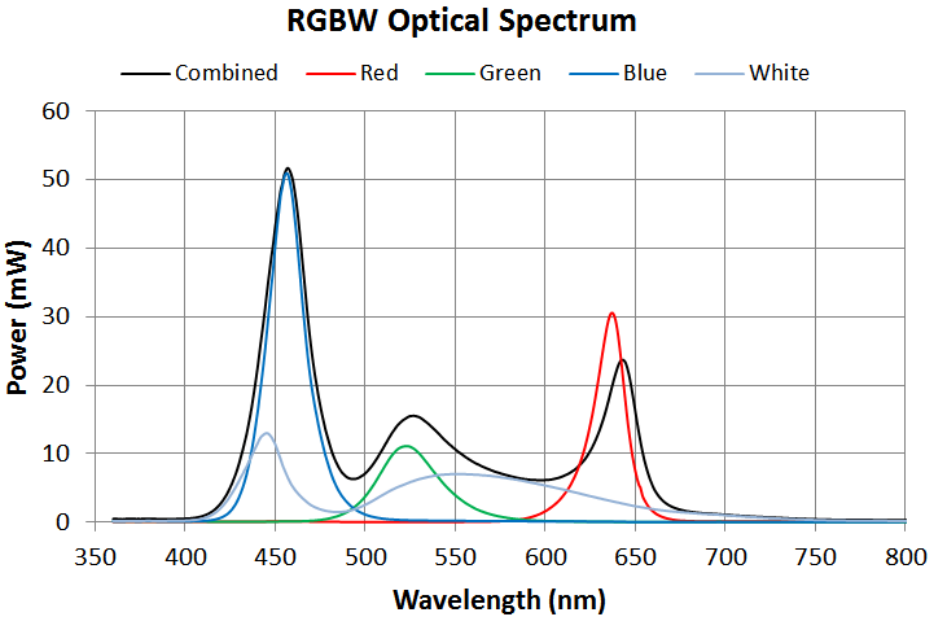


Figure 34: Typical relative spectral power vs wavelength (RGBW model)

Replacement Parts

Multiport Terminal Blocks
Würth Elektronik (Part # **691 364 300 008**)

Power Supply
Mean Well USA (Part # **GS120A24-R7B**)

Fiber Optic Thumb Screw
McMaster Carr (Part # **94567A300**)

Rubber Feet
McMaster Carr (Part # **9541K8**)

Accessories

Locking USB Cable
Sentech USB (Part # **CBL-PD203MBS-2M**)

US Power Cable
TRC Electronics (Part # **3271V86**)

EU Power Cable
TRC Electronics (Part # **2171H576**)

UK Power Cable
TRC Electronics (Part # **210A71H576**)

Return Material Authorization (RMA)

SCHOTT
glass made of ideas

Return Material Authorization (RMA)

Troubleshooting

If you are unsuccessful at resolving the following conditions, contact SCHOTT North America or your sales representative.

CAUTION

Do not attempt to repair the Light Source. Removing the cover will void the warranty.

Problem	Reason/Measure
Indicator LED on front panel does not light up.	Check for power connected to the Light Source.
Indicator LED on front panel is ON continuously, but LED output is dark.	Check polarity settings in software.
Indicator LED blinks	Fault exists. Use software interface to query reason.
Communications over Ethernet not possible even though network jack lights are flashing.	Ensure the Ethernet communication settings are correct.

Technical Support

If the Troubleshooting section does not resolve your issue, contact technical support at: info.microscopy@us.schott.com

If technical support cannot help you resolve your issue remotely, you may need to return your unit under an RMA number. Technical support may suggest you elevate your RMA request to the engineering level. Make sure to mark this on your form to receive this service (additional fees may apply).

Return Material Authorization (RMA)

Service and RMA Policy

Utilize the form on page 93 to gather information that will be needed by customer support. Contact customer support to receive an RMA number. Every field must be complete to receive more than a basic functionality repair and check. If any field is left blank, is not descriptive, or a problem is not reproducible, the repair technician will only repair the unit to pass our factory functional tester. If your problem is intermittent, you need to provide enough detail that the repair technician can replicate the issue to be able to repair it.

Any service required for any reason must be performed by SCHOTT or a SCHOTT authorized service representative. All services outside the warranty will be performed at the purchaser's request, according to normal service charges in effect at the time.

To return any item, whether for warranty repair or chargeable servicing, your RMA number must be clearly visible on the shipping label. All shipping charges must be prepaid.

SCHOTT guarantees all warranty repairs will be completed within two weeks of receipt. All units under warrantee will ship prepaid using our shipping method of choice. Alternate shipping methods will be shipped freight collect.

Warranty and Liabilities

SCHOTT warrants our light sources to be free from defective workmanship and materials. If, within two (2) years from shipment date, any product and/or part thereof are determined by SCHOTT to be defective, we will repair or replace it with new or reconditioned product and/or part.

Warranty is void if:

- We determine the product has been subjected to neglect or misuse, or has been installed following procedures not in accordance with our instruction manual.
- Unauthorized repairs or modifications have occurred.
- The warranty seal has been broken or the serial number label has been altered.

Our obligation is limited to repair or replacement. We will not be held responsible for consequential damages, transportation, installation, adjustment or other expenses arising in connection with our products or parts. This warranty is in lieu of all other statements or guarantees, written or implied, by SCHOTT or SCHOTT authorized representatives.

Return Material Authorization (RMA)

SCHOTT
glass made of ideas

RMA Request Form

Note: All fields must be complete to receive an RMA number from customer service. When describing your problem, please include any information on which interface you are experiencing problems with, what you have tried to fix the issue, how to replicate the problem, etc.

Customer Information	
Name	
Company Name	
Return Shipping Address	
Phone	
Email	

CV-LS Information	
Serial Number	
Describe your complete setup and problem. Please include how the unit is powered, what controls you are using, ambient temperature, etc. Note: “Doesn’t work” is not sufficient to diagnose your issue!	

Return Material Authorization (RMA)

Customer Support

Lighting and Imaging
SCHOTT North America, Inc.
122 Charlton Street
Southbridge, MA 01550
Phone: (508) 765-9744
Fax: (508) 765-1299
E-Mail: info.microscopy@us.schott.com
Website: www.schott.com

Downloads

The data sheet, manuals, drivers, and the CV-LS Dashboard demo application can be downloaded from the SCHOTT website at the following link:

https://www.schott.com/en-us/products/coldvision-fiber-optic-illumination-p1000339/downloads

Technical Support

You can reach us by e-mail at info.microscopy@us.schott.com