

™

MMS User Guide

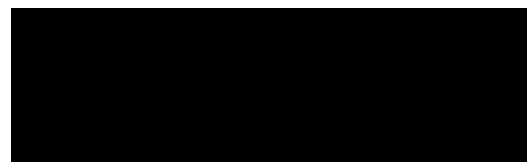
Part No.



PRELIMINARY

Part No: [REDACTED]

Status: DRAFT 1



Technical support: [REDACTED]

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List of acronyms

AR	Anti-reflective coating
CCW	Counter-clockwise
CF	Color filter
CM	Cell and module
CR	Capture range
CW	Clockwise
DIO	Digital input and output
DOF	Depth of field
ESD	Electrostatic discharge
FCC	Federal Communication Commission
FOV	Field of view
FPGA	Field-programmable gate array
LED	Light emitting diode
LR	Linear range
MMS	
NA	Numerical aperture
P	Proportional gain constant
PWM	Pulse width modulation
SNR	Signal-to-noise ratio
TFT	Thin film transistor
T/R	Transmission/reflection ratio
ZAA	Z-axis actuator

CHAPTER 1

Introduction

The [REDACTED]

This chapter provides an overview of [REDACTED], as well as some general product and company information.

The following topics are covered:

- [REDACTED] *description, pg. 12*
- *Intended use, pg. 12*
- *Regulatory compliance, pg. 14*
- *Warranty policy, pg. 14*
- *Parts and equipment replacement, pg. 15*
 - *Warranty repair process, pg. 15*
 - *Disclaimer, pg. 15*
- *Technical support, pg. 16*
- *Safety notices, pg. 16*
- *Warning labels, pg. 17*

MMS description

The [REDACTED] is intended to be used to control [REDACTED]-supplied components, such as: a [REDACTED] sensor, Z-axis actuator (ZAA or ZPS), [REDACTED], and LED modules.

The [REDACTED] sensor determines [REDACTED]. The [REDACTED] connector [REDACTED] panel. The [REDACTED] is a single connector that connects the major components and transfers communication to the major components within a system. The [REDACTED] acts as the central hub between the system and its components, and communicates digital input and output information to the other components in the system. This allows for easy and efficient communication, without the bulk of extra cables.

The [REDACTED] MMS is a Class [REDACTED]

[REDACTED]

Intended use

The [REDACTED] MMS is intended to be operated and stored under the following conditions:

- 1) In a clean environment, such as a laboratory or clean room.
- 2) In a temperature- and humidity-controlled environment.
- 3) In a mechanically quiet environment (i.e., without vibration) to avoid damaging internal optical components.

NOTE: If the [REDACTED] is used in an environment with contaminant levels that will noticeably erode a [REDACTED] surface over a period of less than [REDACTED], the warranty will be void.

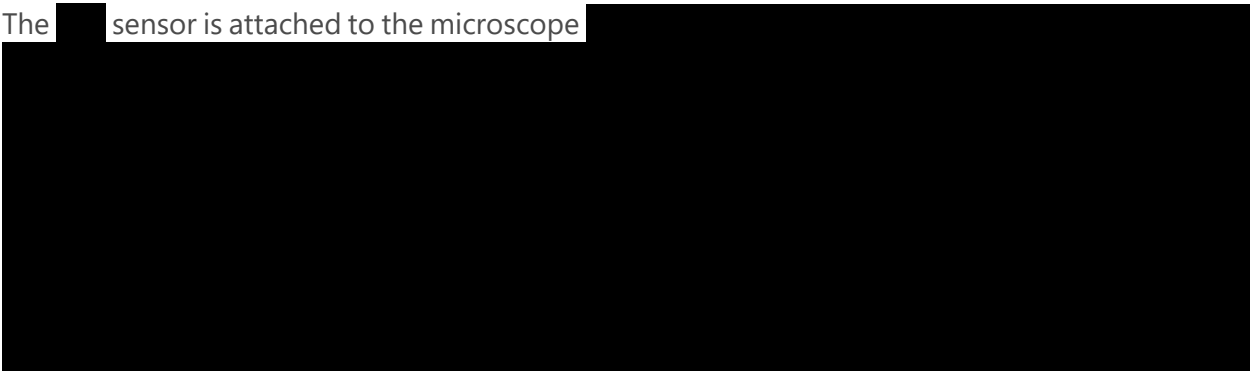
NOTE: [REDACTED] takes no responsibility for poor performance or malfunction of the system if the conditions described in this section are not met.

Laser classification

Both [REDACTED] sensor were tested and comply with EN [REDACTED] laser product.

Although the [REDACTED] sensor contains an embedded Class [REDACTED] laser component and may be rated as a Class [REDACTED] laser product, when properly integrated as part of a complete MMS and used as intended, the system rating is a **Class [REDACTED] laser product**. This is because the standards are concerned with laser radiation exposure to the user within the scope of the intended use of the product, and the intended use of this product is to be used as part of a complete system.

The [REDACTED] sensor is attached to the microscope [REDACTED]



Regulatory compliance

The [REDACTED] equipment has been tested and found to comply with the limits of a Class [REDACTED] digital device in accordance with Part 15 of the FCC rules and regulations found in Section 15.105. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

NOTE: *If the product is modified or changed, the FCC and/or CE approval becomes invalid. In this case, you are responsible for ensuring product conformity.*

The equipment generates and radiates radio frequency energy and, if not installed and used in accordance with this user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

Information to user (FCC Section 15.21) – The user is cautioned that any changes or modifications not expressly approved by [REDACTED] or an authorized representative could void the user's authority to operate the equipment.

Special accessories (FCC Section 15.27) – The user is cautioned that any peripheral device installed with this equipment, such as a computer, must be connected with a high-quality shielded cable to ensure compliance with FCC limits.

Warranty policy

[REDACTED] warrants each new customer product to be free of defects caused by faulty materials or poor workmanship for a period of [REDACTED] months from the date the system was installed by [REDACTED] or an authorized dealer or agent. The Warranty Policy does not apply to defects caused by abnormal events or misuse, improper maintenance or installation, including excessive wear, for which [REDACTED] is not responsible.

Parts and equipment replacement

It is at the sole discretion of [REDACTED] to repair or replace any unit or part that fails within the limits of the Warranty Policy.

The Warranty Policy is valid only on [REDACTED]. Replacement of parts, components, and/or PCB boards during a warranty repair does not extend the original warranty period.

[REDACTED] are not covered by the Warranty Policy.

Warranty repair process

Key components of [REDACTED] products are relatively small and are not field repairable. Warranty repairs are performed at [REDACTED] manufacturing or service locations.

When requesting warranty service, customers must obtain a Return of Materials Request (RMA) from [REDACTED] and provide the following information:

- Purchase Date
- Problem Description
- Equipment Model Number and Serial Number

Labor and all other costs for the removal of the [REDACTED] component being returned for repair and subsequent replacement at the customer's site are not covered by the Warranty Policy. Removal is provided by the customer or system provider, or an appropriate dealer.

Disclaimer

Maximum liability shall not, in any case, exceed the contract price of the products claimed to be defective. Consequent damages including, but not limited to, any loss of profit, property damage, or personal injury are not covered by the Warranty Policy.

Changes to [REDACTED] products

[REDACTED] reserves the right to improve, change, or modify products without incurring any obligations to make changes to previous [REDACTED] equipment.

Technical support

For technical support, please contact our Applications Team at [REDACTED].

Safety notices

In this document, cautions and warnings are defined as follows:

- **Warning** – Identifies a danger that could result in personal injury or death.
- **Caution** – Identifies a hazard that could result in damage to equipment or loss of data.

WARNING! Do not open the sensor's cover.

WARNING! Do not stare into the laser beam.

Warning labels

[REDACTED] products have labels affixed to their enclosures, similar or identical to those shown below.

WARNING! Be sure to read and follow all warning labels.



Laser products are hazardous when intra-beam ocular exposure occurs for any duration of time. [REDACTED] lasers can produce minor skin injuries and pose a risk of igniting inflammable materials. However, this is only likely when the beam has a small diameter or is focused.



Visible or invisible laser radiation warning. Avoid direct exposure to beam.



The laser output is outside the visible [REDACTED] nanometer wavelength range.



Electrostatic discharge (ESD) can damage or destroy electronic components. Keep electrostatic generating materials at least one meter away from all components.

NOTE:

Electromagnetism represents a potential danger caused by a High Magnetic Field on or around the components to which these labels are affixed. The danger is more prone, but not limited, to those having a pacemaker. Care must also be

taken when using magnetically attracted tools and/or implements around these devices.



Pinch Point Hazard Keep Clear label represents a potential danger for a person or part of a person's body to be caught between moving parts of a machine, or between moving and stationary parts of a machine.

CHAPTER 2

Setting up the system

This chapter describes how to install the [REDACTED] on the microscope system and connect the components. Be sure to read this chapter completely before attempting to install the system.

The following topics are covered:

- *System overview, pg. 20*
- *System components, pg. 21*
- *Typical system setup, pg. 22*
 - *General installation principles, pg. 24*
- *System communication, pg. 25*
- *Sensor status indicator, pg. 35*
- *Motion status indicators, pg. 36*

System overview

Figure 1 illustrates the components and connections for a complete ██████████, which is the main focus of this user guide. The ██████████ is sold as a microscope system with its components. The ██████████ sensor serves as the central hub between the Host system and the ██████████™ components, such as: a Z-stage, ██████████ LED illuminator (see *Figure 1*). For details, see "██████████ MMS specifications" on page 46.

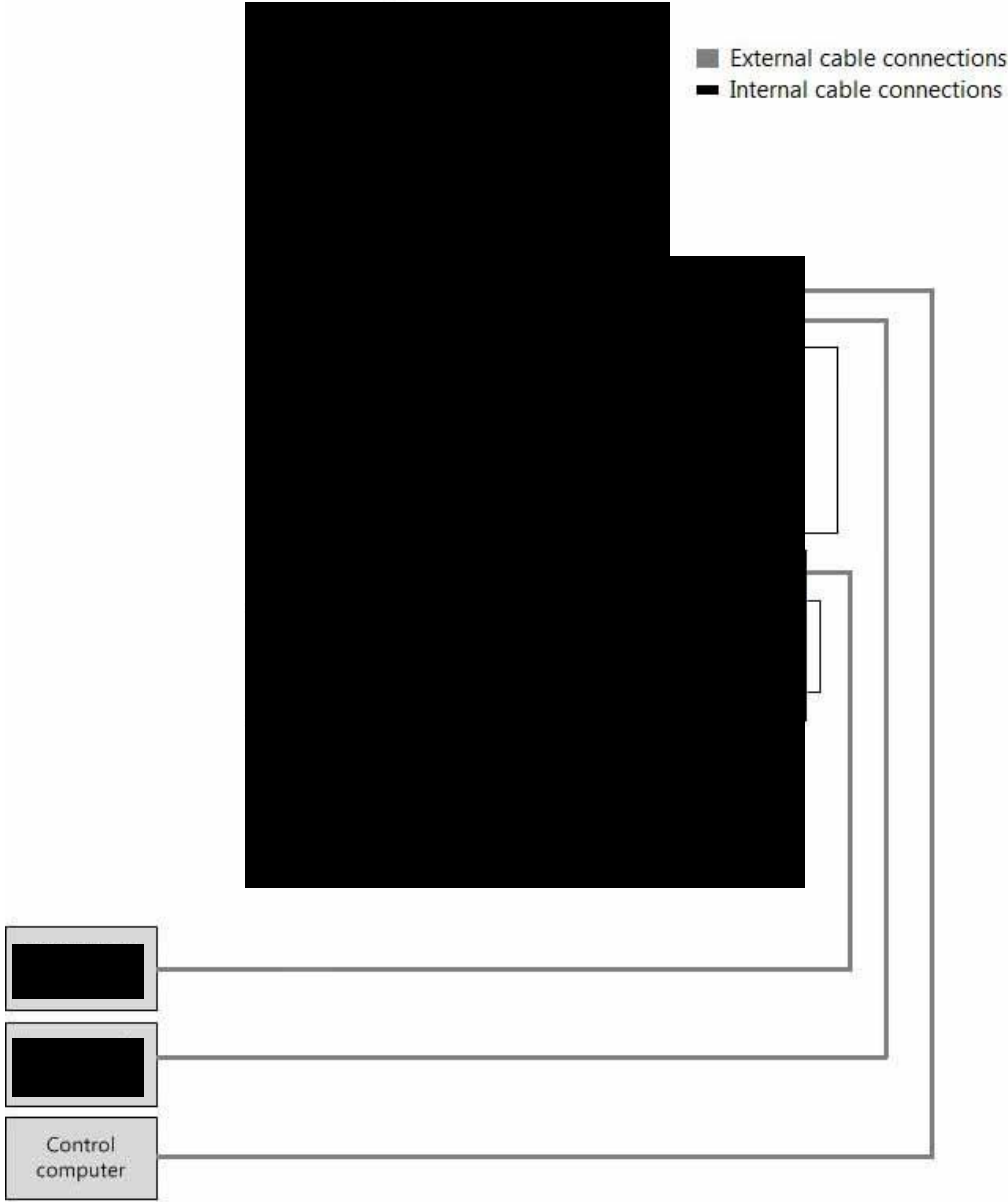


Figure 1 System overview

System components

Before you begin installing the system, ensure that you have all the components and cables listed in this section.

The following system components are supplied by [REDACTED]:

- **Sensor** [REDACTED] and is the central hub for connecting the rest of the system's components. The optical port [REDACTED] sensor is located on the side of the sensor's panel and allows the sensor to [REDACTED] specimens accurately and quickly. This is the part number [REDACTED] part number for the [REDACTED]. For connection details, see "*System communication*" on page 25.
 - The [REDACTED] is supplied with a [REDACTED] connector for communication with [REDACTED] computer and system components. For details on [REDACTED] *communication*" on page 25.
 - The back of the [REDACTED] also has an RJ45 connector for Ethernet communication. For details on Ethernet communication, see "*Ethernet*" on page 33.

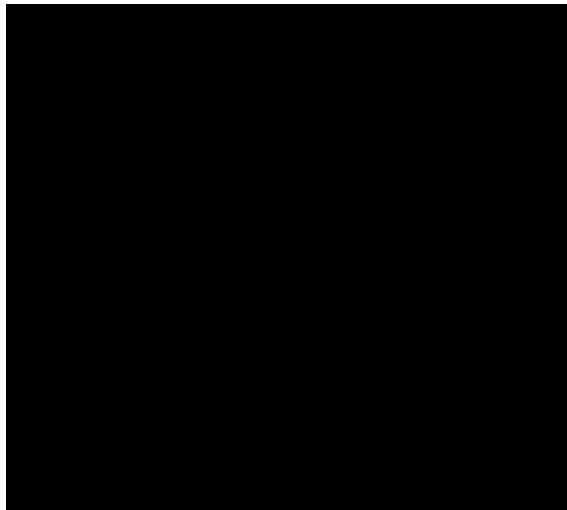


Figure 2 Sensor with [REDACTED] connector and RJ45 connector

- **Connector Kit** (Part # [REDACTED]) – A connector kit is provided with the [REDACTED]. For details on the [REDACTED] connector, see "[REDACTED]" on page 26.
- **Z-stage** – Z-axis actuator (ZAA or ZPS) for Z-axis movement, complete with limit switches. For details on the Z-stage, see "*Z-stage*" on page 28.

- **LED illuminator** (Part # [REDACTED]) – On [REDACTED] LED illuminator is provided with the system for illumination. The system can support one [REDACTED] LED illuminator. For details, see "*LED dimensions*" on page 58.

The following user-supplied components are also required:

- **Power supply** – A [REDACTED] power supply must be supplied for standard [REDACTED]. optional [REDACTED] dc power supply must be supplied for [REDACTED].
- **Control computer** – The software used to configure and operate the [REDACTED] system must be installed on a user-supplied computer. Ensure that the [REDACTED] has a grounded power cable.
- **Ethernet CAT-6 cable** (Part # [REDACTED]) – Ethernet cable to connect to the host [REDACTED] the [REDACTED] (minimum requirement: CAT-5E cable).
- **Review camera** – The microscope system requires a review camera or imaging [REDACTED] capturing image during autofocus.

Typical system setup

A typical [REDACTED] setup includes a microscope system and its components, such as: a [REDACTED] sensor, Z-stage, [REDACTED] LED illuminator. When the [REDACTED] sensor is used in an [REDACTED] as shown in *Figure 3*, the sensor projects the [REDACTED] through the objective lens and onto the target.

[REDACTED] All input and output communication is transferred through [REDACTED]™ connector on the sensor's back panel.

In general, the setup must ensure that:

- The microscope's objective lens is [REDACTED] with the review camera and tube lens.
- The microscope's main optical axis is [REDACTED] to the objective plane and camera image plane.
- The review camera is [REDACTED] with the microscope's optical axis.

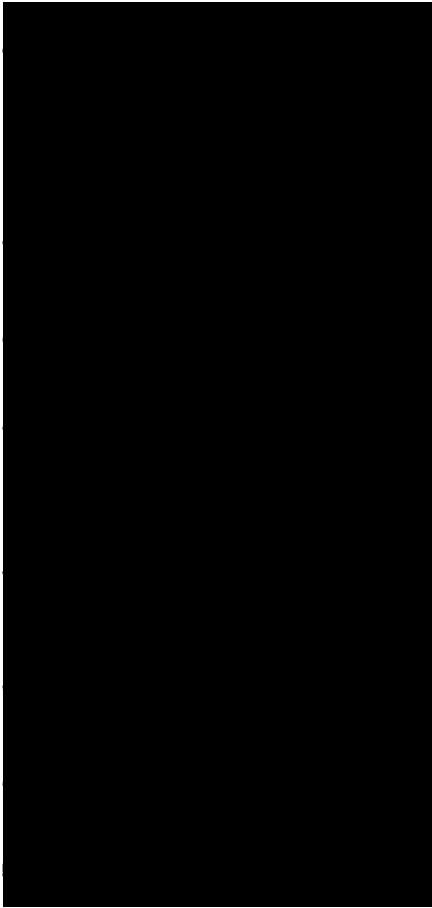


Figure 3 Typical microscope setup

If autofocus is enabled, the sensor provides continuous motion corrections to a stepper motor through the **XXXXXX**™ system communication, resulting in the actuation of the Z-stage or any motion device **XXXXXX** focus error.

The sensor operates best when the laser line width is the **XXXXXX**. To prevent aberrations in the images, the laser beam must pass through the objective lens **XXXXXX**.

When the distance between the objective lens and the sensor is less than **XXXXXX**, angular adjustment is generally not required and reliance on machining tolerance is adequate. If the distance is greater than **XXXXXX**, a coupling filter angular adjustment is required

General installation principles

Although each installation is different, the following principles must be adhered to regardless of the setup.

Minimize stray light and reflections

When stray light from other sources enters the sensor, it can affect the sensor's accuracy and range. One of the main causes of stray light is stray reflection.

Stray reflections can come from other optical components within the system that are:

- not properly coated with anti-reflection coating;
- not properly aligned; or
- have reflective surfaces (e.g., glass or aluminum placed at 90° to the optical axis).

NOTE: *If your setup requires a surface to be positioned 90° to the optical axis, ensure that the surface is non-reflective, rough, or has a small radial curve.*

System communication

Most of the system components communicate directly through the **██████████**™ connector (see [Figure 4](#)). For details on the connections, see the following sections.

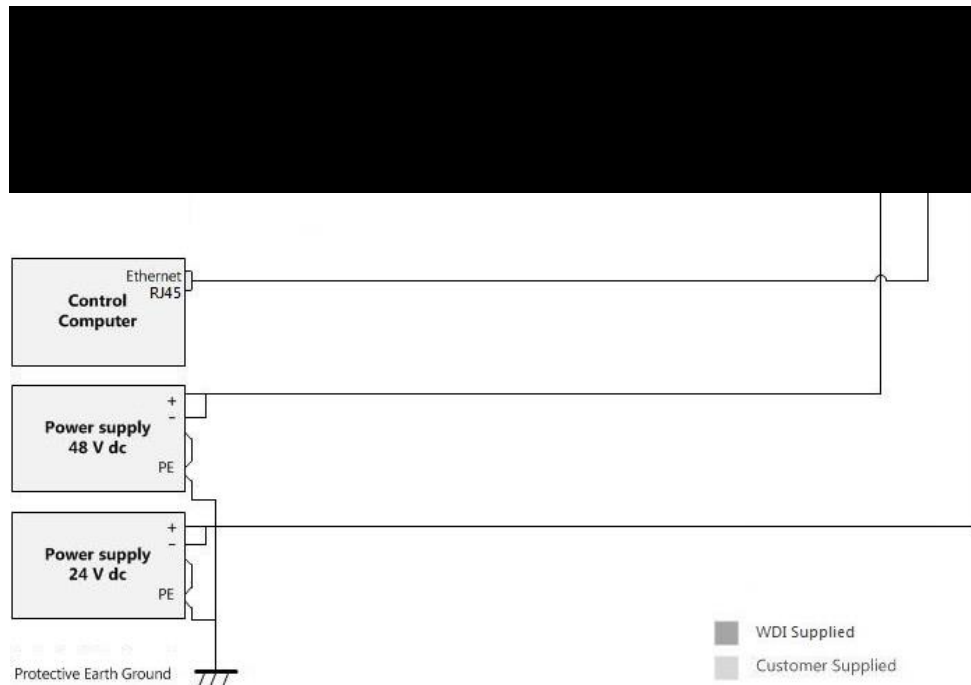


Figure 4 Protective earth block diagram *(image incomplete, for illustration purposes only)*

The system components must be grounded or connected to protective earth ground (PE) to prevent electromagnetic interference (EMI). The **██████████**™ **██████████** can pick up electromagnetic radiation from high power and high frequency sources. If not adequately grounded, the electrical noise and ground shift can degrade system performance.

System components

This section describes the different system components of the **██████████**™ MMS: **██████████** sensor, Zstage, **██████████**, and LED illuminator. The **██████████**™ connector, located on the sensor's back panel, acts as the central hub for all system component communication.

The system components are as follows:

- **██████████ sensor** (Part # **██████████**) - Central hub for system connections, complete with a **██████████** pin **██████████**™ connector and RJ45 connector.
- **Z-stage** - A Z-axis actuator for actuation of the Z-axis stage, complete with limit switches.
- **LED illuminator** (Part # **██████████**) - One **██████████** A LED or two **██████████** A LEDs for camera illumination.

- _____

For details on these connections, refer to the following sections.

sensor

Most of the system connections are connected directly through the **RS-485**™ connector. The **RS-485**™ connector, also known as the **RS-485**™ connector, is located on the sensor's back panel. The **RS-485**™ connector is a 5-pin connector located on the back panel of the **RS-485** sensor for communicating input and output information to the other system components. The **RS-485**™ connector can be configured and customized for specific requirements. Contact our applications team for more details. For **RS-485**™ and **RS-485** sensor specifications, see "**sensor dimensions**" on page 47. For pin assignments, refer to **Table 1**.

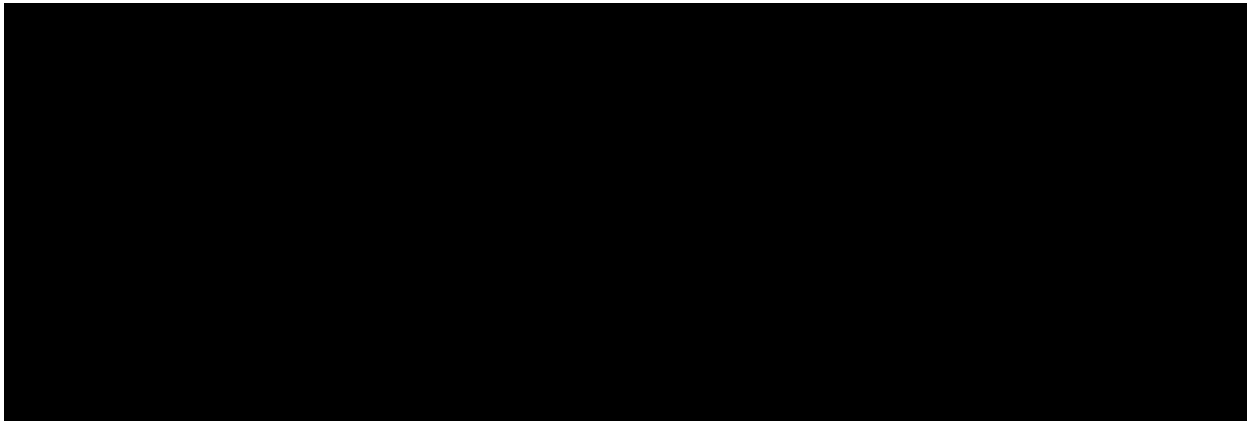
The [REDACTED] sensor input and output is transmitted through the [REDACTED]™ connector. The [REDACTED]™ connector connects directly to the [REDACTED] sensor and communicates to the rest of the system components. The [REDACTED] sensor has an RJ45 connector on the sensor's back panel that connects directly to the control computer via a CAT6e cable (Part # [REDACTED]) for Ethernet communication.



Figure 5 ™ connector

Table 1 ™ MMS pin assignments

Pin	Signal	Description
1	PWR	V dc power supply
2	PWR	V dc power supply
3	GND	Power ground
4	GND	Power ground
5	-	Reserved
7	GND/SH	Power ground
8	IO1	User programmable I/O - default unused
9	IO2	User programmable I/O - default unused



Z-stage

██████████ Z-stage has a built in two-phase stepper motor, designed to control a motor-driven Z-axis of the microscopy payload. ██████████ has two variations of Z-stages: ZPS and ZAA. For your specific configuration, see *"Z-stage dimensions" on page 49* and ██████████[™] *MMS dimensions" on page 59*.

The Z-stage cable should be a ██████████ AWG shielded two twisted pair cable. The maximum length of the cable is 1.8 meters. The motor inside the Z-stage receives its power from the ██████████ V dc power supply connected to the ██████████ sensor.

The phase current and microsteps are set by ██████████ during initialization. ██████████'s two-phase stepper motor drive has a phase current that is selectable at ██████████ A and ██████████ A, with a phase voltage of ██████████ V dc. The microsteps are set at: ██████████. For Z-stage specifications, see *Table 2*.

Table 2 Z-stage specifications (ZAA and ZPS)

Parameters	ZAA	ZPS
Motion type	Stepper motor	
Motion controller	Integrated	
Positional feedback	██████████ sensor	
Travel range	± ██████████ mm	
Total travel	██████████ mm	
Maximum load	██████████ kg	██████████ kg
Maximum speed	██████████ mm/s	
Maximum acceleration	██████████ mm/s ²	
Maximum resolution	██████████ mm/mstep	██████████ mm/mstep
Number of phases	██████████	

Current phase	██████████ A
Micro Stepping	██████████

LED illuminator

██████████'s Z-stage also integrates a two-channels LED driver (██████████ A per channel) for camera illumination. The channels can be put in parallel to drive up to ██████████ LED module. For most applications, only one ██████████ LED illuminator is used; however, two ██████████ A LED illuminators can be used (for example, to provide illumination from the bottom or in a different color).

You can purchase an LED from ██████████, or you can provide your own. For LED illuminator (Part #██████████) mechanical dimensions, see *"LED dimensions" on page 58*. For LED specifications, see *Table 3*. For compatible ██████████ LED illuminator variations, see *Table 4*.

Table 3 LED illuminator specifications (Part #800273)

Parameter	Value
Maximum output voltage	██████████
Maximum output current	██████████ per channel
Minimum pulse width	██████████
Analog dimming range	██████████
PWM dimming range	██████████
PWM frequency	██████████ Hz
External trigger delay	██████████ seconds
Pulse width	██████████ seconds

Table 4 LED variations specifications

██████████ part number	Description	Max. Current (CW)	Nominal wavelength	Minimum Flux (lm)
██████████ ██████████	Illuminator-HPLED3- ██████████	██████████	██████████	██████████
██████████	Illuminator-██████████	██████████	██████████	██████████

LLC-SM & LLC-LG

WARNING! The LLC unit contains a strong magnet that can affect pacemakers and other electromagnetic equipment. People with pacemakers should stay a safe distance away from the unit at all times.

small and large linear lens changers (LLC-SM & LLC-LG) connect directly to a user-supplied motion device or Z-stage. Commands and responses to the are communicated through the interface. comes with an controller hard-wired on to the, and connects directly the Z-axis motion device in the system. V dc power supply is required to power the For mechanical dimensions, see "Appendix" on page 45. For specifications, see Table 5. For specifications, see Table 6. For controller pin assignments, see Table 7.

Table 5 specifications

Specifications	-SM 3+		
Maximum number of lens inserts			
Objective lens type			
Objective ring light illumination			
Weight excluding lenses			
Lens spacing center to center			
Lens change time*			
*1 - 5			
*1 - 4			
*1 - 3			
*1 - 2			
Motor type			
Motion actuation implementation			
Encoder			
Servo type			
Positioning repeatability	± μm		

Table 5 specifications (continued)

Specifications	3+
Peak current	A
Compliance	
Bearings	
Controller	

Table 6 specifications

Specifications	3+
Maximum number of lens inserts	
Objective lens type	
Objective ring light illumination	
Weight excluding lenses	
Lens spacing center to center	
Lens change time*	
Motor type	
Motion actuation implementation	
Encoder	
Servo type	
Positioning repeatability	
Bearings	
Controller	
Supply voltage	
Peak current	

Table 7 Controller pin assignments

Pin	Signal	Description
2	PWR	power supply
3	GND	Power ground
5	-	Reserved
8	TRIG	Trigger output
9	NC (IO2)	Programmable I/O Reserved for
10	NC (IO3)	Programmable I/O Reserved for
13	IO4/E-STOP	Emergency stop input
15	dTrig+	Reserved

System cabling

The [REDACTED] comes as a complete system with most components connected prior to shipping. This section describes the system cabling required on the user-end, for the following:

- **Power supply** - 5V dc power supply for the sensor, and 12V dc power supply for the LLC controller.
- **Ethernet cable** - A CAT-6E cable connecting the sensor to the control computer.
- **DIO** - Digital input/output for the E-Stop, C-Sync, In-Range, and In-Focus.

Power supply

There are two power connections for the [REDACTED], one [REDACTED] V dc power supply and one [REDACTED] - [REDACTED] V dc power supply. The power input supplies the [REDACTED] sensor with [REDACTED] V dc power. The power supply connects directly to the [REDACTED] connector on the [REDACTED] sensor. For pin assignments, see [Table 1](#). You must assemble the cable using the [REDACTED] V dc connector provided. We recommend using a [REDACTED] AWG shielded cable.

There is a [REDACTED] - [REDACTED] V dc power supply for the LLC unit on [REDACTED]. The power connection connects directly to the LLC controller, which is hard-wired on to the [REDACTED]. For pin assignments, see [Table 1](#). You must assemble the cable using the [REDACTED] V dc connector provided. We recommend using a [REDACTED] AWG shielded cable.

Ethernet

The Ethernet communication on [REDACTED] sensor connects directly to the system control computer. The Ethernet connection allows for communication to the rest of the system components [REDACTED]™ interface. The recommended Ethernet cable is a 6 foot Cat-6E cable (Part # [REDACTED]), or a minimum of a Cat-5E cable. For connection details, see *"Connecting PC to sensor" on page 42.*

NOTE: The Ethernet cable is not provided by [REDACTED].

DIO

This section describes the digital input/output connections. The DIO connections are located on the connector. For DIO pin connections, see [Table 1](#).

There are two digital inputs as follows:

- E-Stop input – [REDACTED]
[REDACTED]
[REDACTED]

- **C-Sync input** –

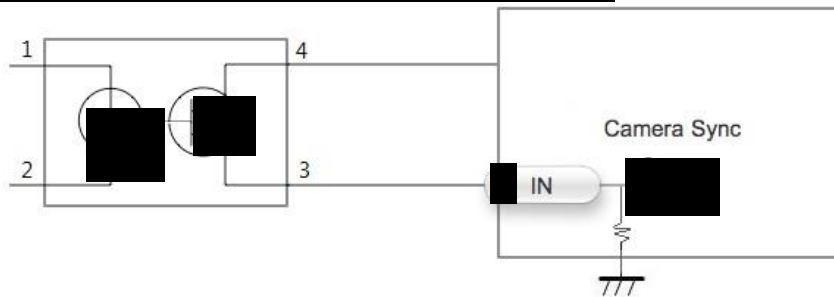


Figure 6 C-Sync wiring

- **In-Range output** –

- **In-Focus output** –

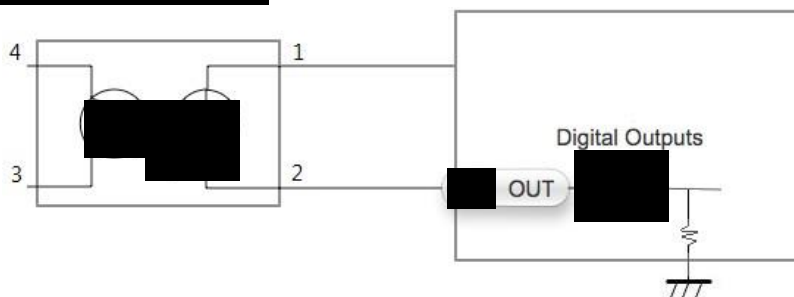


Figure 7 In-Range and In-Focus wiring

Sensor status indicator

The sensor has one status indicator on the sensor’s back panel, as shown in *Figure 8*. When the sensor is powered up, the indicator will light up and is then deactivated by the software to prevent any extraneous light from affecting the setup. During normal operation, the functions are as described in *Table 8*.

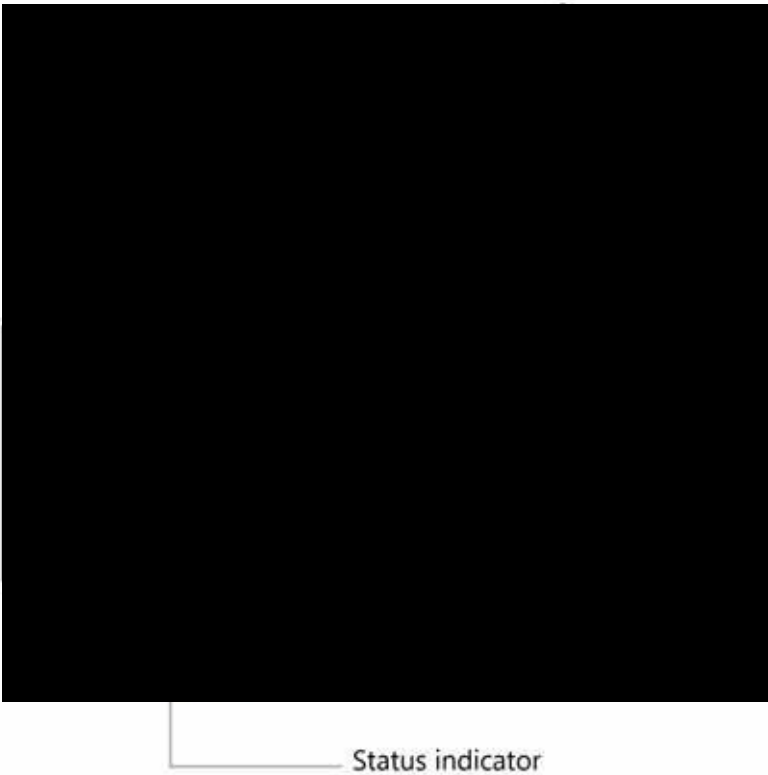


Figure 8 *Sensor status indicator*

Table 8 **Sensor status indicator functions**

Colour	Function
Red	Lights up red when the system is not connected.
Red	Blinks when there is an error or the software is loading.
Green	Lights up green when the system is connected.

Motion status indicators

This section provides the description for the motion status indicators on the Autofocus Console software's main panel. For a description of each status indicator, see [Table 9](#). For details, see [Software Reference User Guide](#).

NOTE: There are three status indicator colors: yellow, red, and green. If the status indicator is gray or has no color, it is not connected.

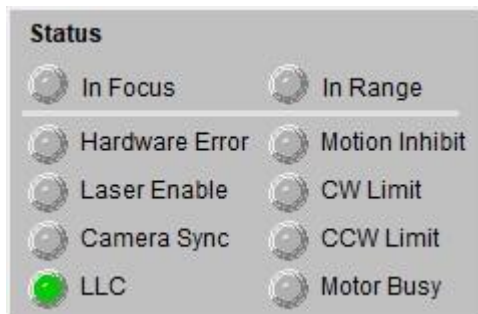


Figure 9 Motion status indicators

Table 9 Motion status indicators function

Status	Description
In Focus	When green, the sensor output is within range.
In Range	When green, the sensor is operating within the capture range and there is adequate reflected light reaching the sensor to detect the target.
Hardware Error	When red, there is a hardware problem.
Motion Inhibit	When yellow, there is an external digital input signal preventing the Z-stage motion and the laser is OFF.
Laser Enable	When green, the laser is turned ON. This indicator corresponds to Laser ON/OFF.
Camera Sync	When green, sync digital input is asserted.
CW Limit	When green, the clockwise limit switch or counter-clockwise limit switch is detected.
CCW Limit	When yellow, the Z-stage movement is stopped.
LLC	When green, the LLC is detected and active from a communications point of view. When red, the LLC is detected but there is an error.
Motor Busy	When green, the Z-stage motor is in motion and busy.

CHAPTER 3

Installing the software

This chapter describes how to install the [REDACTED] sensor's [REDACTED] Console software.

The following topics are covered:

- *Computer system requirements, pg. 38*
- *Installing the software, pg. 38*
- *Connecting PC to sensor, pg. 42*
- *Uninstalling the software, pg. 43*
- *Exiting the software, pg. 43*

Computer system requirements

The Autofocus Console software requires the following basic system configuration:

- Windows 7 operating system or later
- At least 8 GB of RAM for Windows 7
- At least 50 MB of free hard disk space
- A display with at least 1024 x 768 pixel resolution
- Ethernet compatibility

Installing the software

The **Autofocus** Console software must be installed on the control computer before the sensor can be configured or used. The **Autofocus** Console software installer features a standard Microsoft Windows setup interface, which is simple and easy to use. You can install multiple versions of the **Autofocus** Console software on the same computer, provided that you select different installation folders.

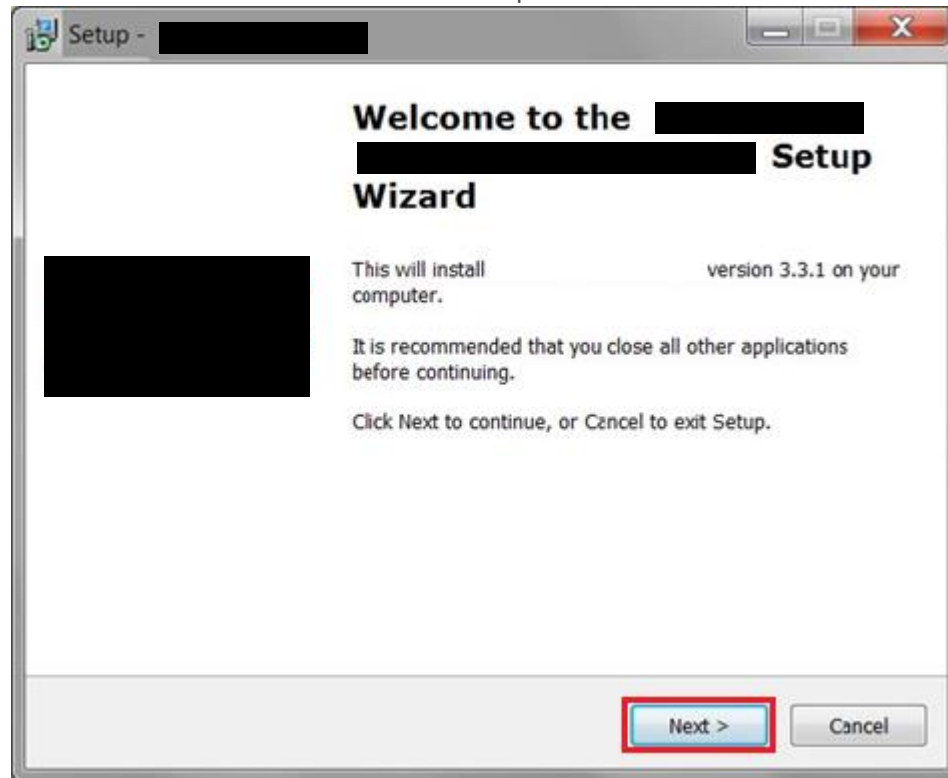
NOTE: For more information about the software, refer to the *Autofocus Console Software User Manual*. To obtain a copy, contact the Applications Team at [sample@\[REDACTED\].com](mailto:sample@[REDACTED].com).

NOTE: To create your own software application that can be used to configure and operate the [REDACTED] sensor, refer to the [REDACTED] Functions Library Manual and the [REDACTED] zip file. If you require a copy, please contact [REDACTED]

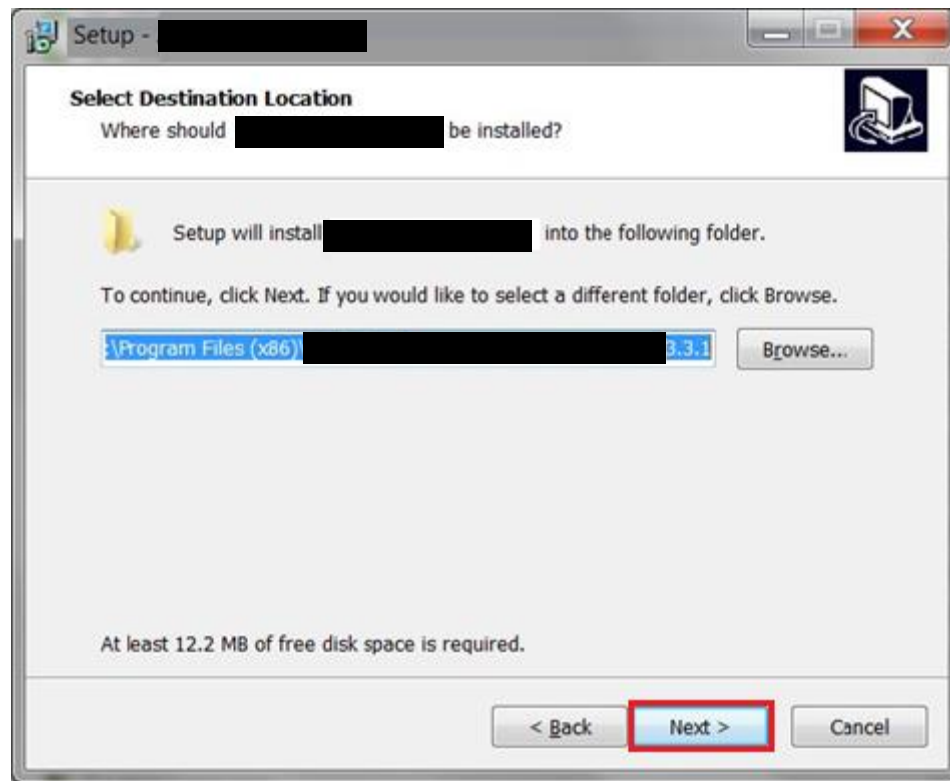
To install the **Autofocus** Console software:

1. Double-click the [REDACTED] **Setup.zip** file. This procedure shows screen-shots for the version 3.3.6 as an example.

2. On the **Welcome** screen, click **Next** to proceed with the installation.

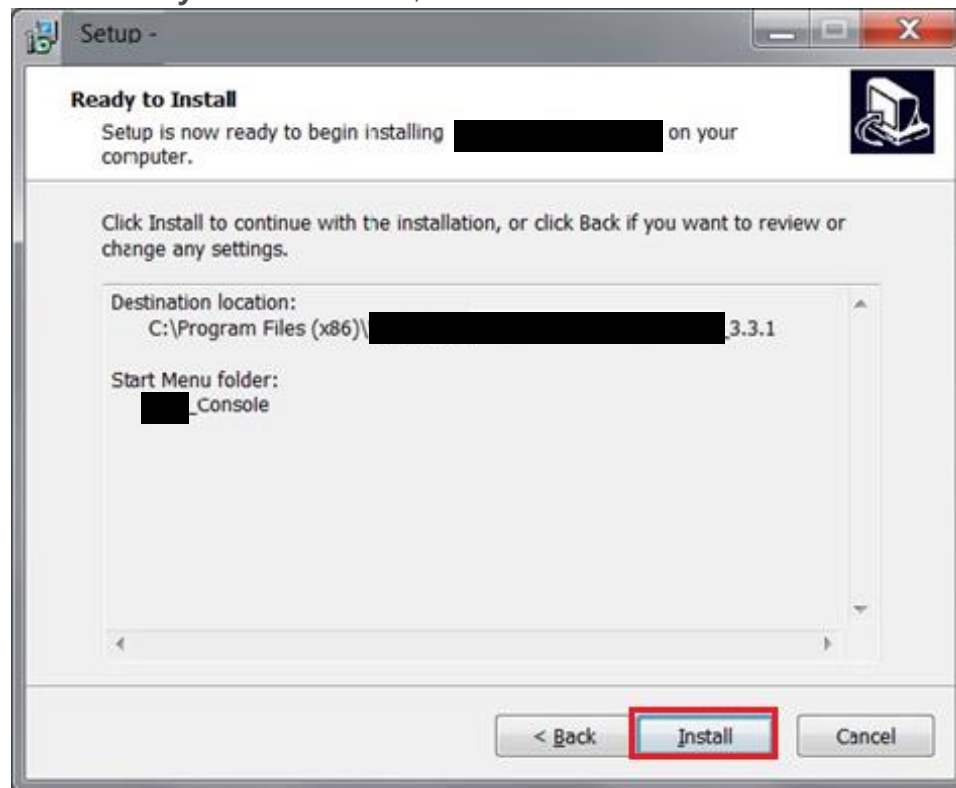


3. On the **Select Destination** Location screen, accept the default destination folder for the application files, or browse to select a different folder, and then click **Next**.

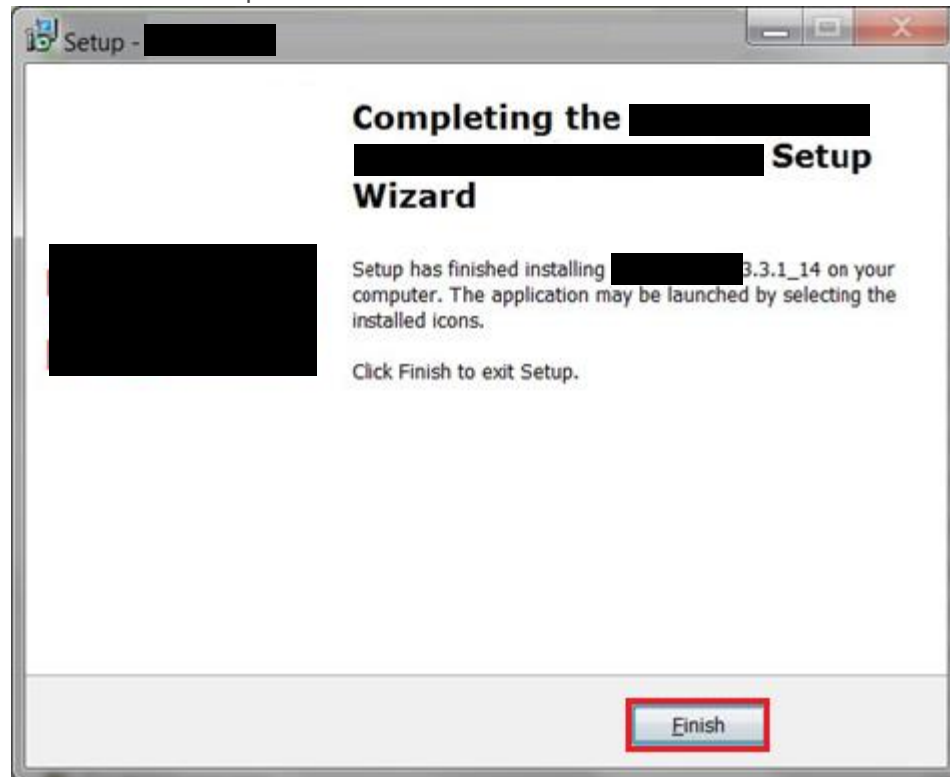


4. On the **Select Start Menu Folder** screen, accept the default folder on the Start Menu or browse to select a different folder, and then click **Next**.

5. On the **Ready to Install** screen, click **Install**.



6. **Completing the [REDACTED] console Setup Wizard** screen, click **Finish**. The installation is complete.



Connecting PC to sensor

This section provides instructions on how to connect to the PC. For detailed procedures, refer to *[REDACTED] Software Console User Guide*.

To connect to the Ethernet connection on the [REDACTED] Console software:

1. Open the [REDACTED] **Software Console**.
2. On the main panel window, under **COM Port**, select the [REDACTED] communication from the list.
3. Connection is established and all control panels become available on the main panel window.

Uninstalling the software

You can uninstall the [REDACTED] Console software in one of two ways:

1. Using the [REDACTED] Console Uninstall application that is located in the [REDACTED] Console installation folder.
2. Using the **Uninstall a program** feature in the Windows Control Panel.

Exiting the software

When you are finished using the [REDACTED] sensor, you should exit the [REDACTED] Console software. It is good practice to save the current settings to the sensor before you exit.

To exit the software:

1. If you want to save the current settings (including all the settings in the Parameter dialog box and any other open dialog boxes), at the bottom of the Parameter dialog box, click **Save to Sensor**. The current settings become the default values that are used the next time you start the software.
2. At the bottom of the main panel, click **Exit**.
3. When the system asks if you are sure you want to exit, click **Yes**. All the open windows and dialog boxes are closed.

CHAPTER 4

Appendix

This chapter provides electrical specifications and mechanical dimensions of the [REDACTED].

The following topics are covered:

- [REDACTED] *specifications, pg. 46*
- *Mechanical dimensions, pg. 47*
 - *PFA sensor dimensions, pg. 47*
 - *Z-stage dimensions, pg. 49*
- *LLC with controller dimensions, pg. 51*
- *LED dimensions, pg. 58*
- [REDACTED] *dimensions, pg. 59*

██████████TM MMS specifications

This section provides the specifications for the ██████████.

Table 10 Electrical specifications

Description	Value
Power supply voltage	██████████ and
Ethernet supported speeds	██████████ Mbps

Table 11 Environmental specifications

Description	Value
Operating ambient temperature	████°C to █████°C
Transport temperature	-████°C to █████°C
Storage temperature	████°C to █████°C
Humidity temperature	████% to █████% non-condensing

Mechanical dimensions

This section provides the mechanical dimensions in millimeters. The following are covered in this section: [REDACTED] sensor, LLC with controller, Z-stage, LED module, and [REDACTED].

[REDACTED] sensor dimensions



Figure 10 [REDACTED] sensor screw dimensions

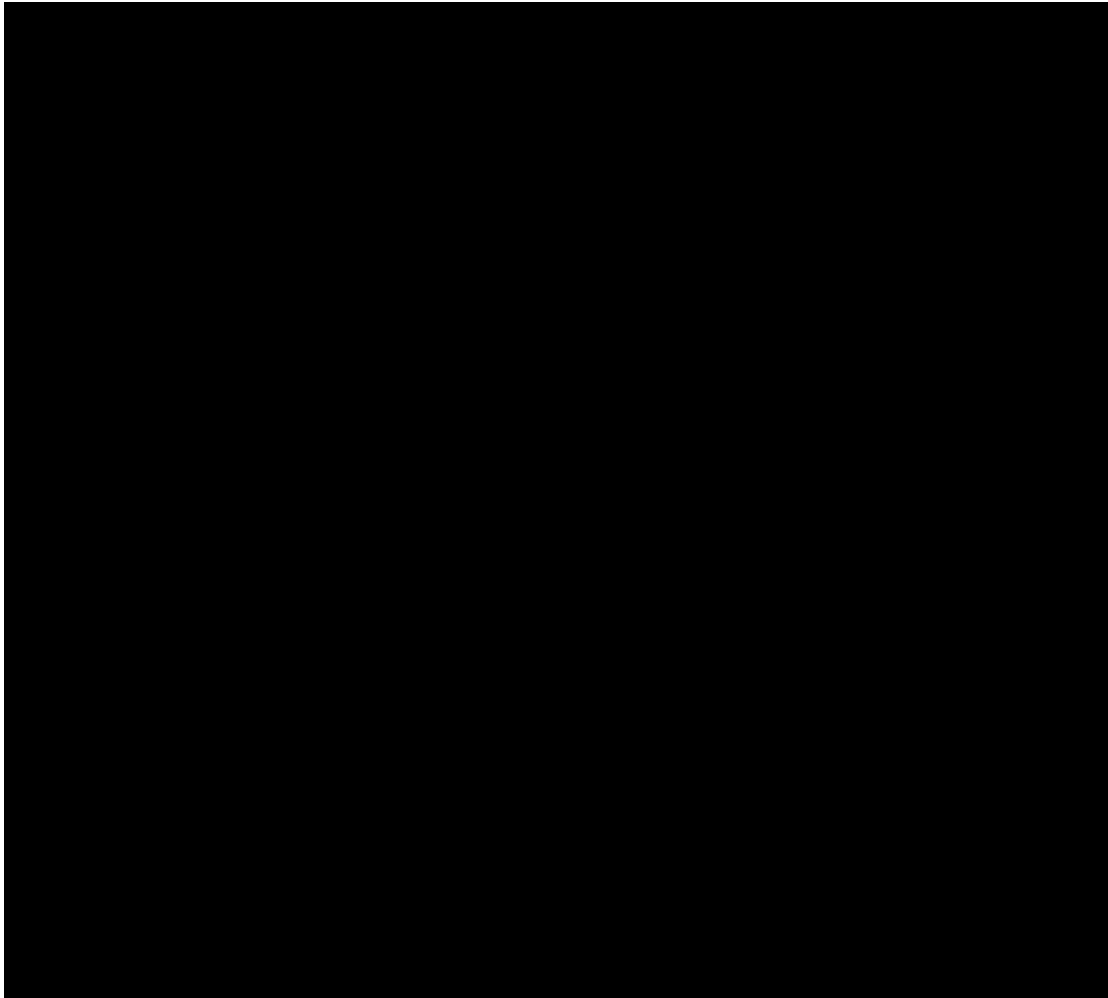


Figure 11  *sensor dimensions*

Z-stage dimensions

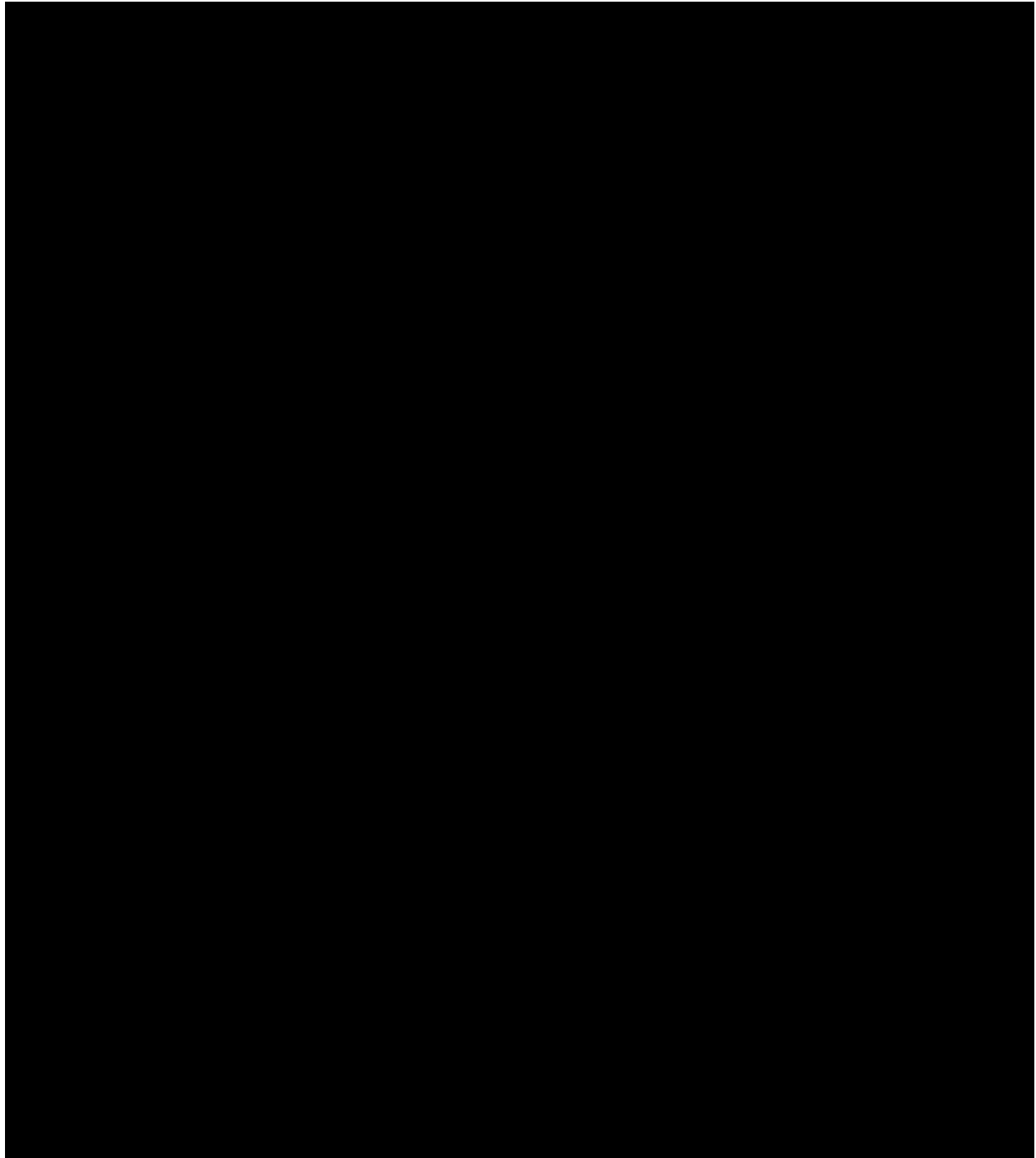


Figure 12 ZAA dimensions

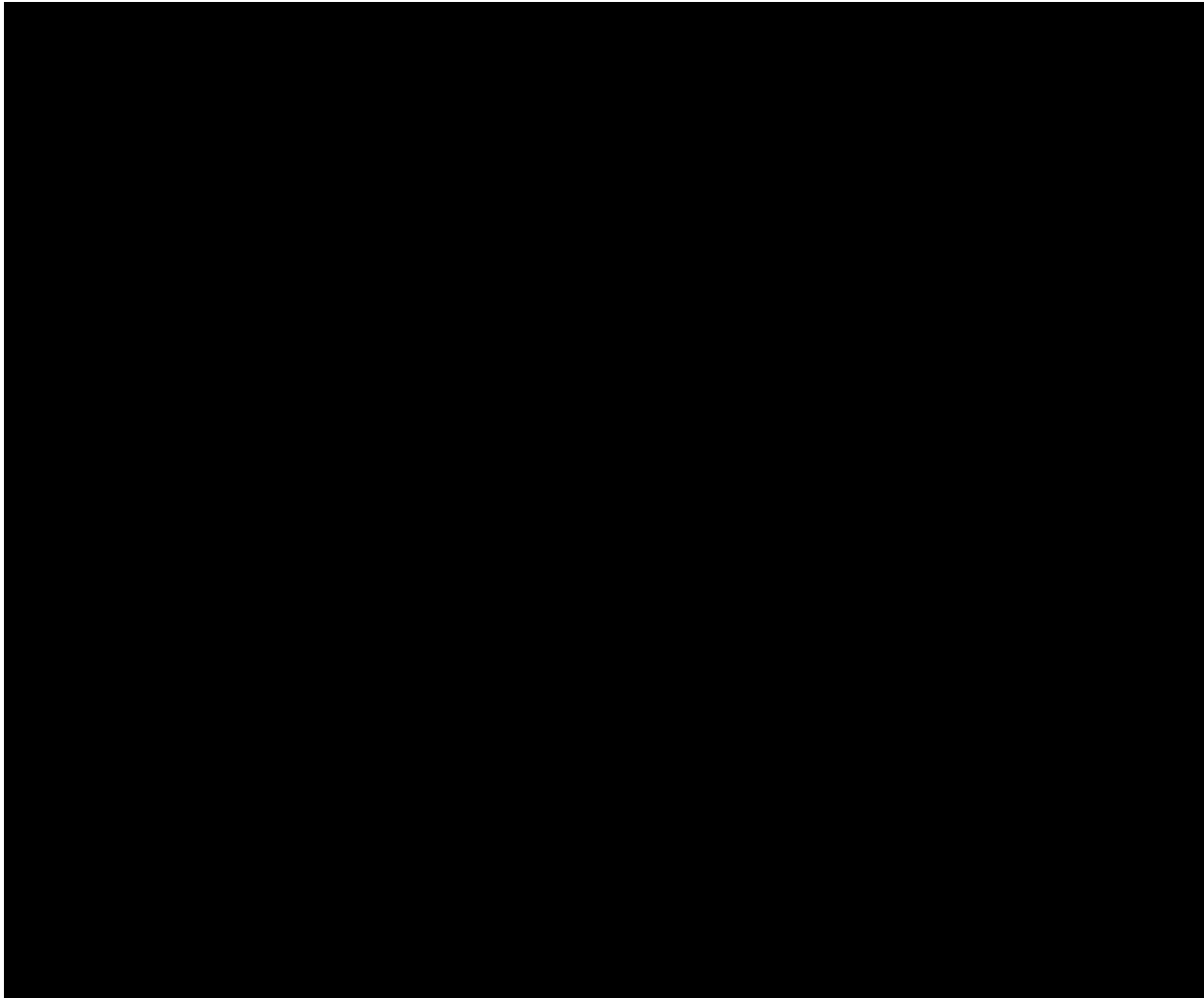


Figure 13 *ZPS dimensions*

LLC with controller dimensions

Front

Bottom

Figure 14 LLC with controller dimensions - part 1

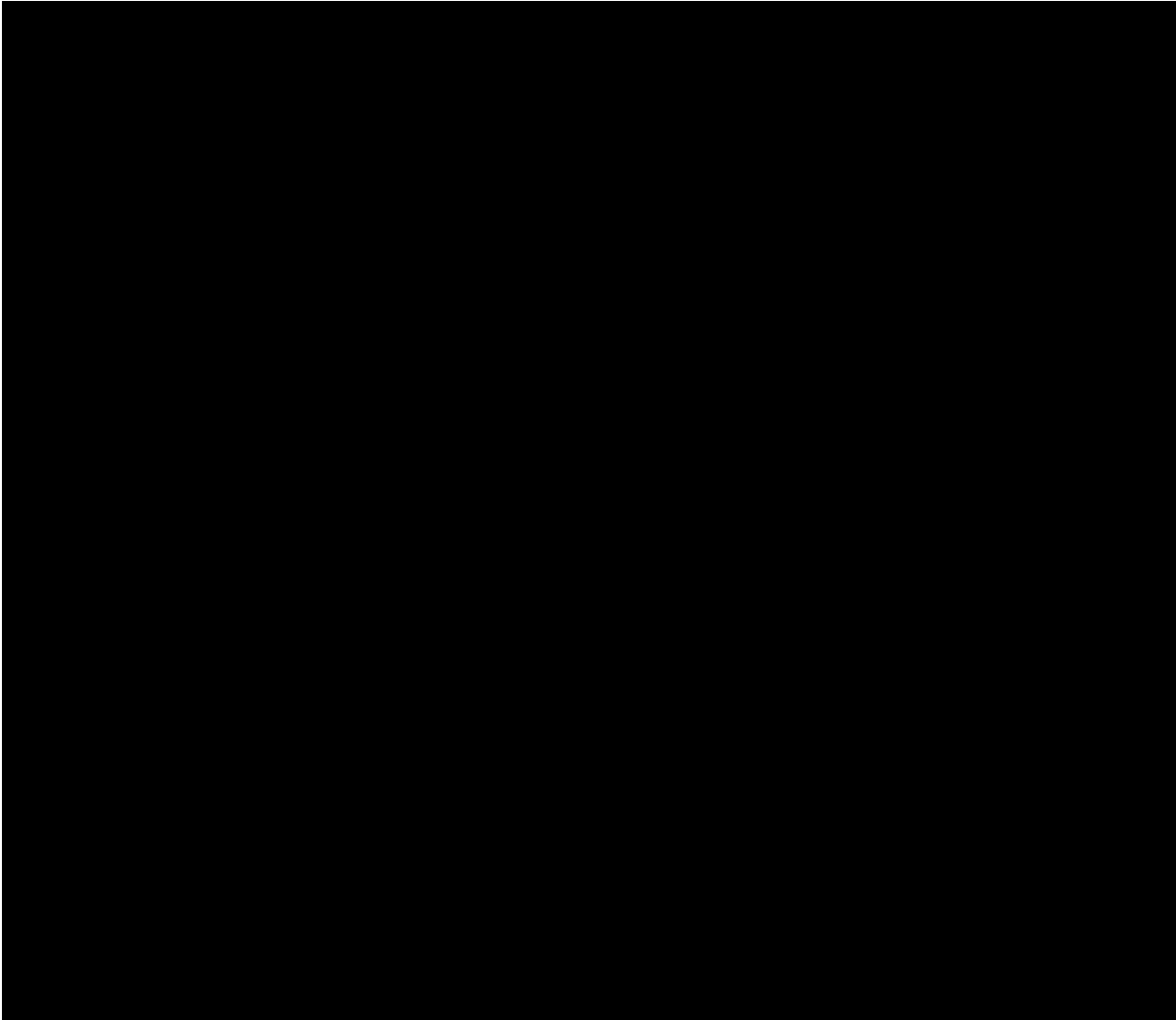


Figure 15 *LLC with controller dimensions - part 2*

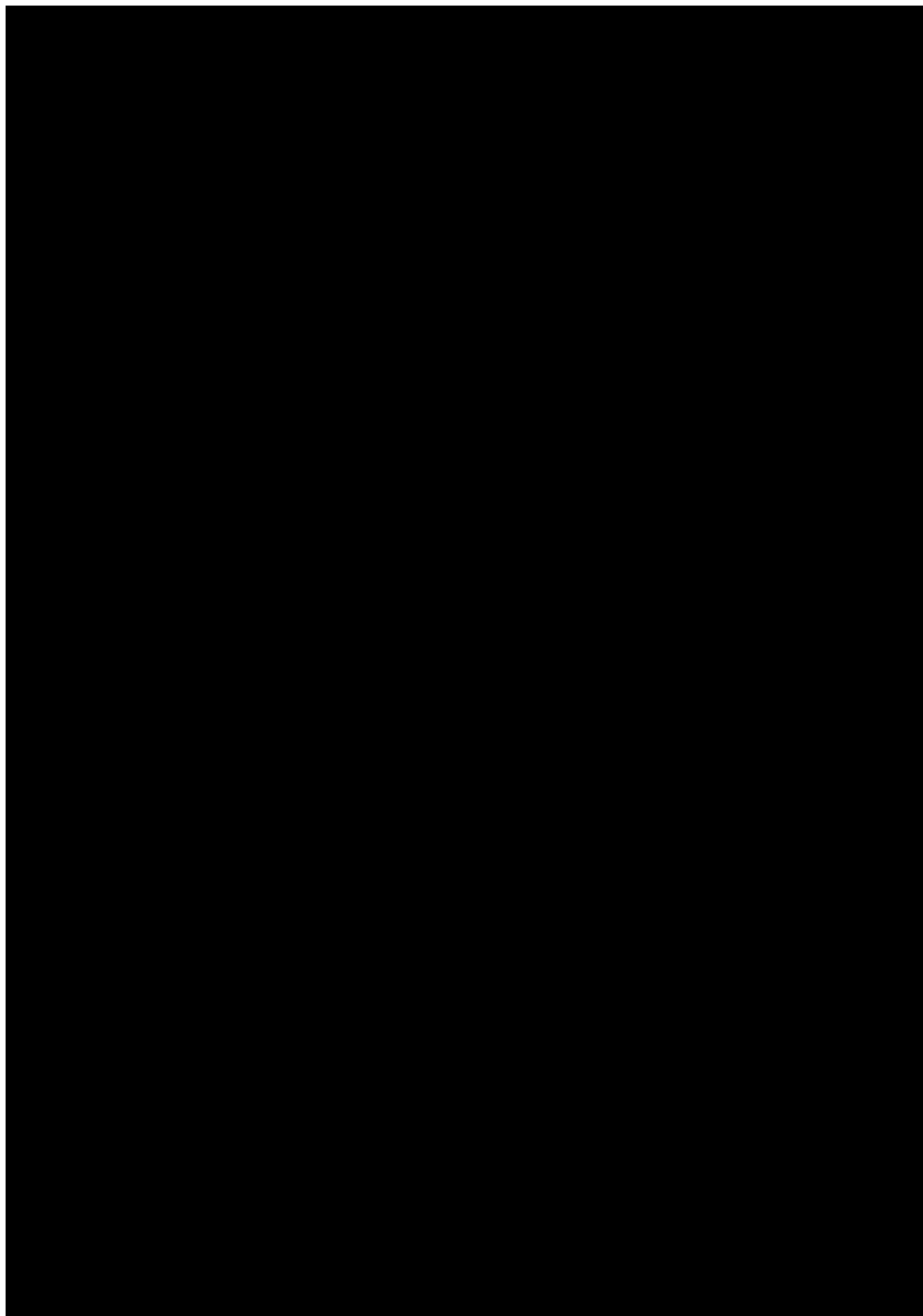


Figure 16 LLC-LG dimensions - part 1

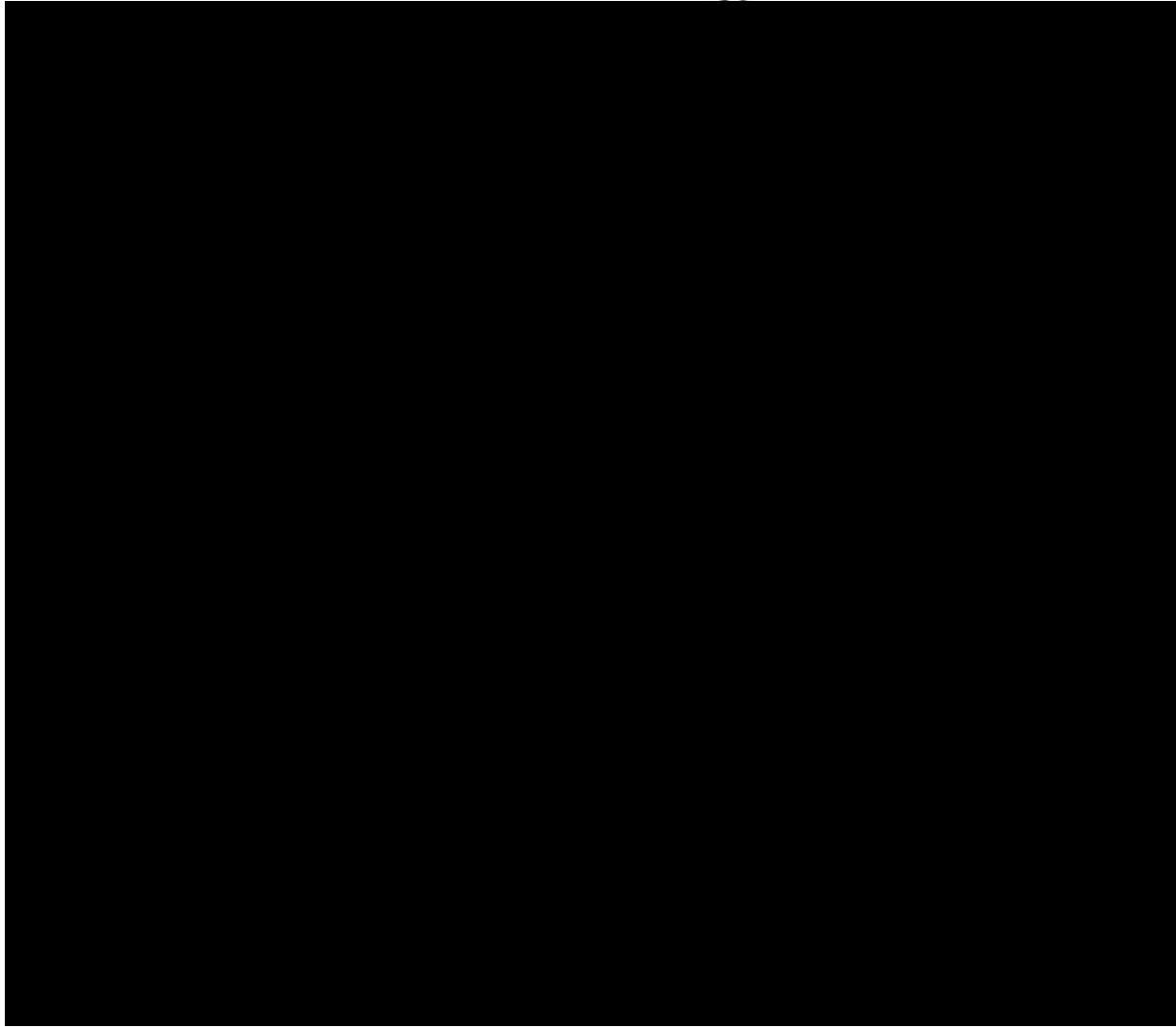


Figure 17 LLC-LG dimensions - part 2

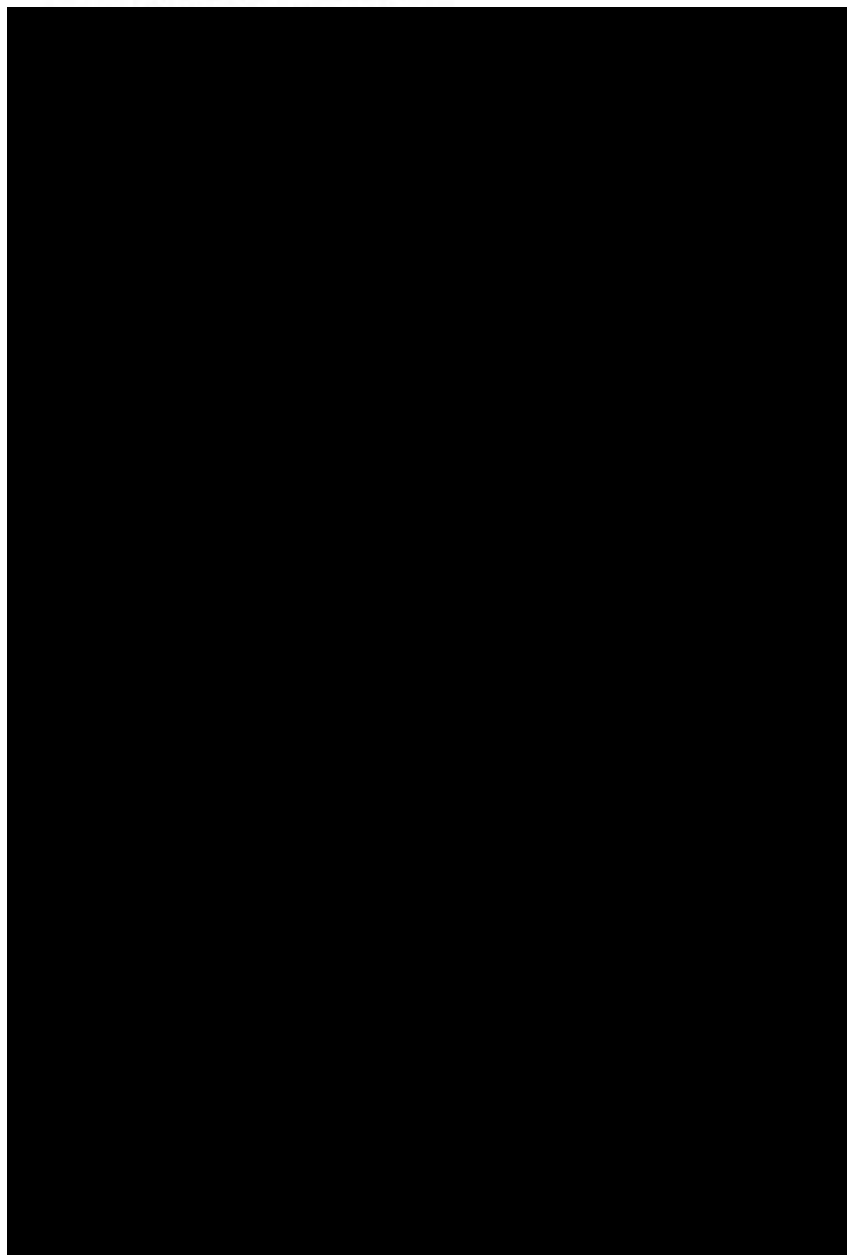


Figure 18 LLC-LG objective inserts dimensions



Figure 19 *LLC-SM objective inserts dimensions*

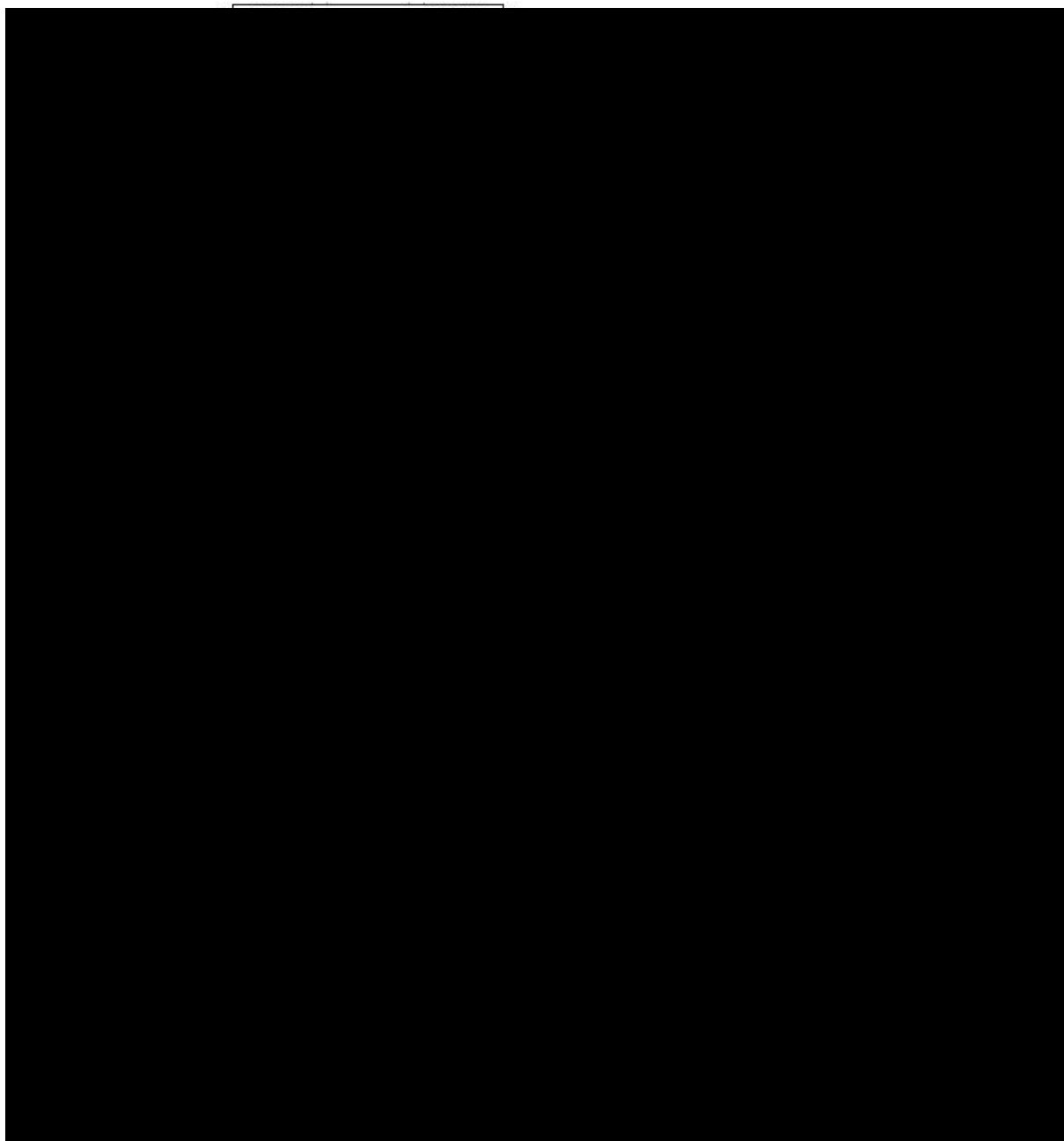


Figure 20 *LLC controller dimensions*

LED dimensions

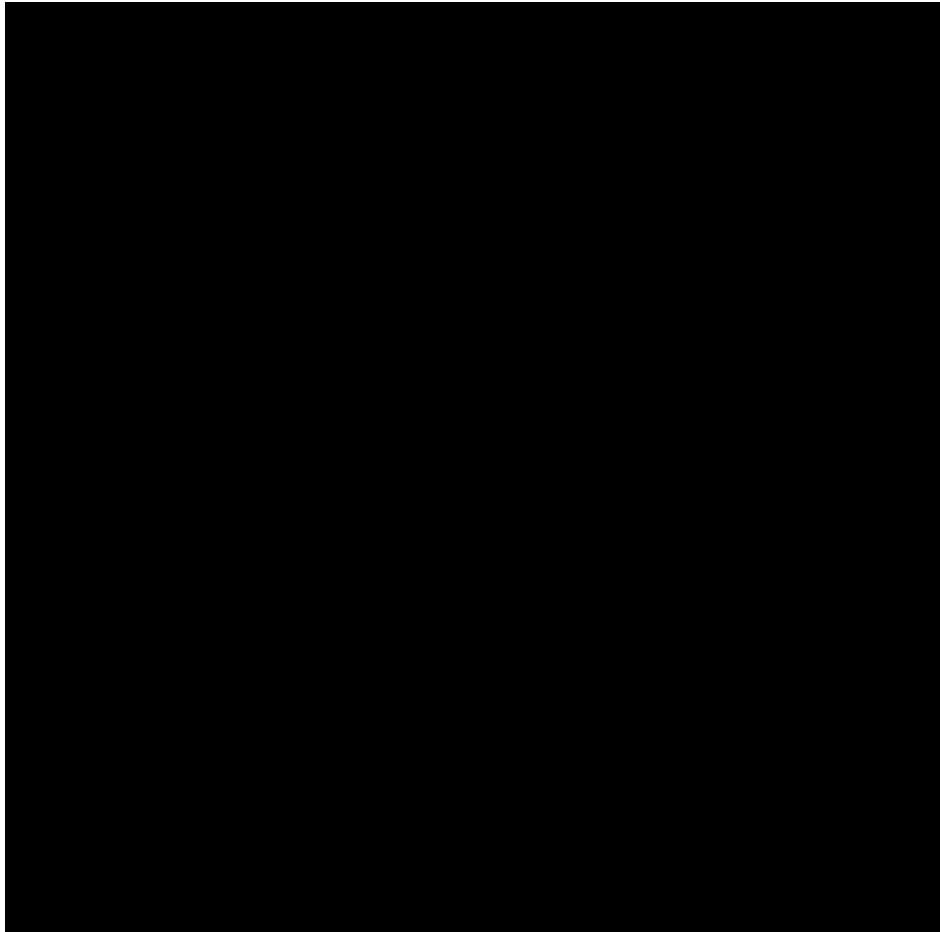


Figure 21 *LED illuminator dimensions*

dimensions

This section provides mechanical dimension drawings for a typical setup of the .
Figure 22 and *Figure 23* illustrate a .

NOTE: *Contact our Applications Team for more information on variations.*

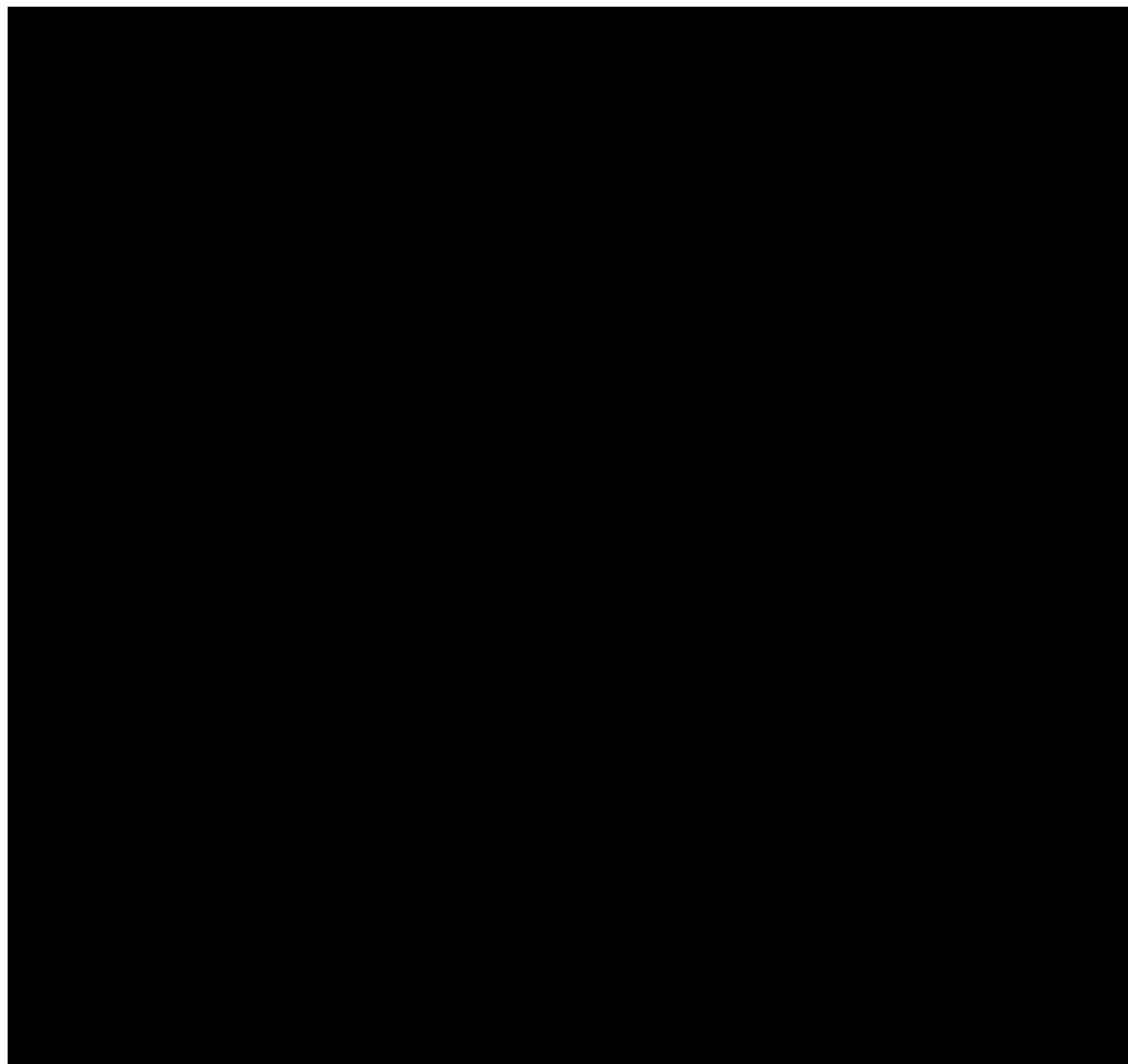


Figure 22 overall dimensions - part 1

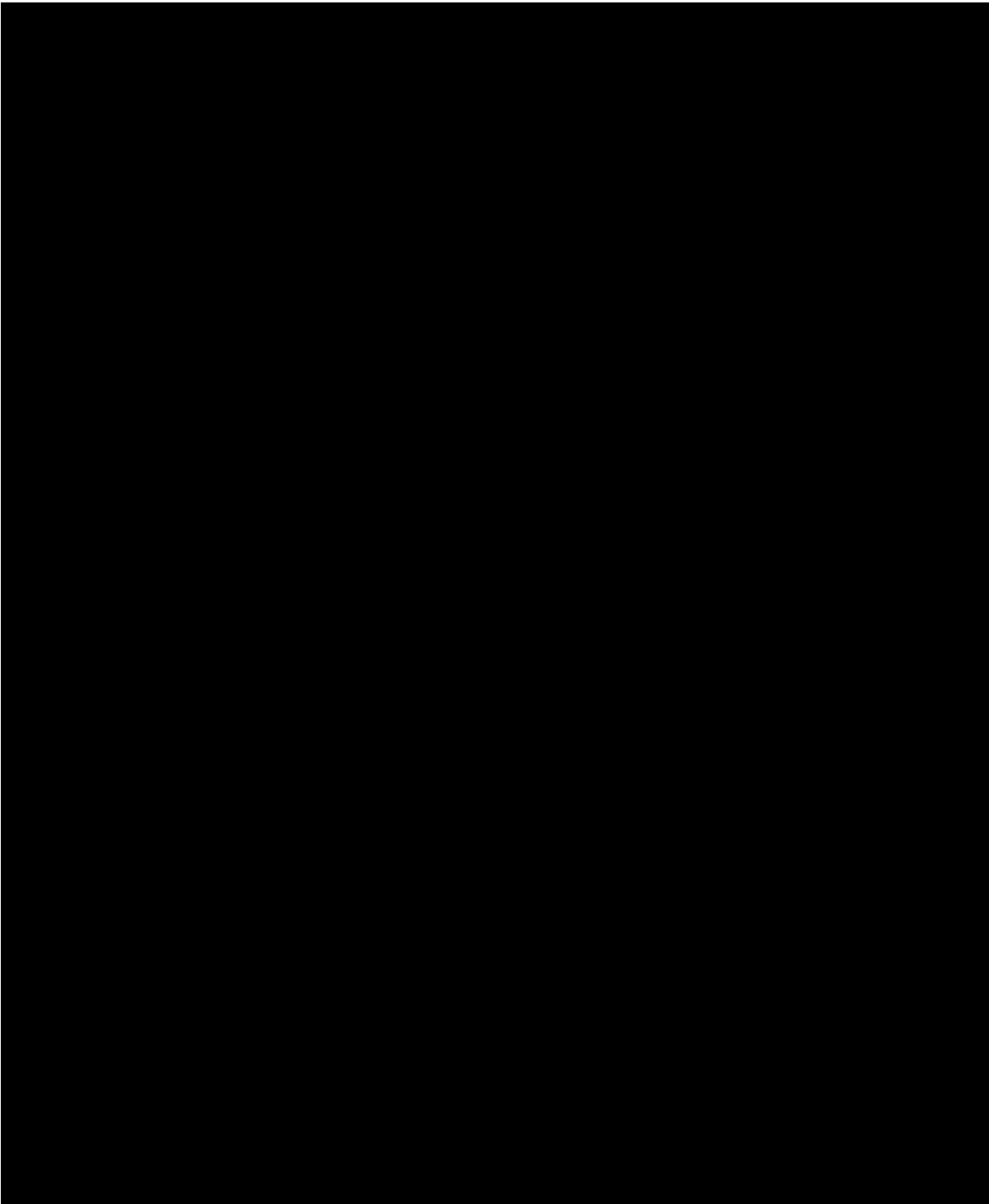


Figure 23
dimensions - part 2