

# DIS-III OPERATORS MANUAL



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

Date: September 2, 2014 Rev -

**Graflex, Incorporated**



**Always on Target**

# Revision History

Original Publication Date September 2, 2014:

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

Date Dec 14, 2011 Rev -

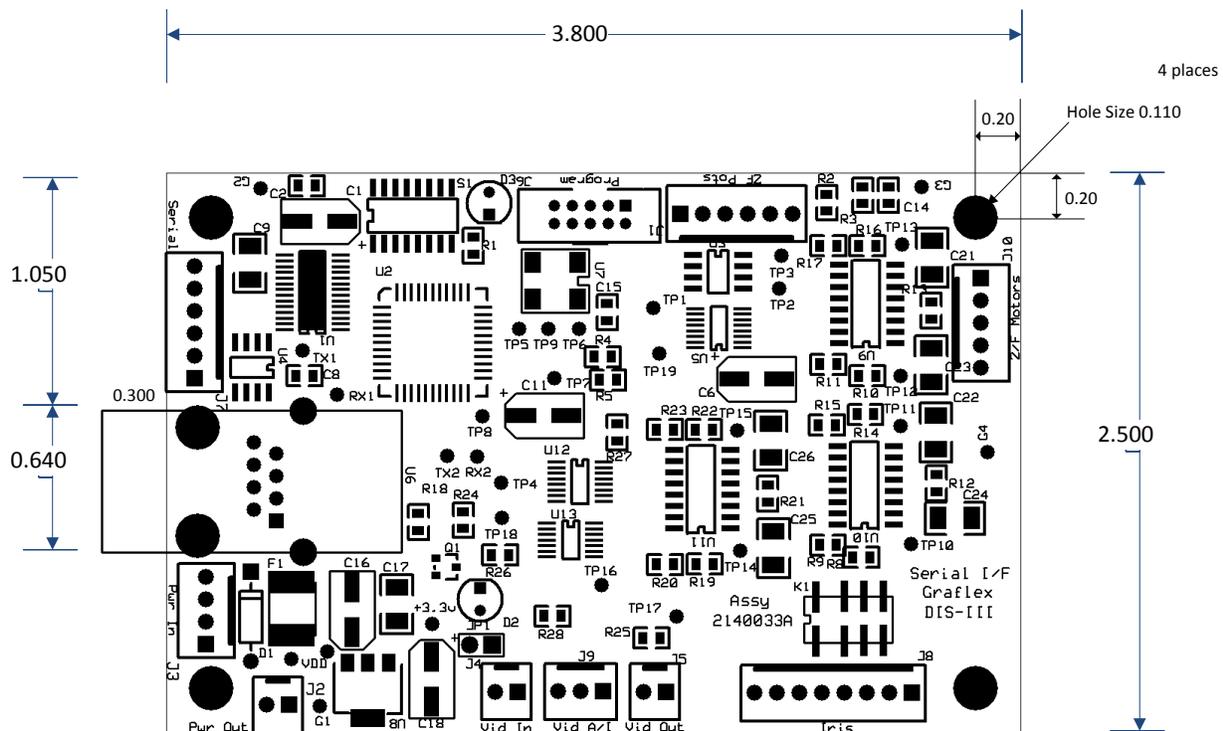


# IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the DIS-III Lens Controller. Follow the safety instructions listed below. Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Make sure there is plenty of room above the DIS-III PCB for connector mounting and wiring. One inch should be adequate.
- 4) If using the Ethernet connection, be sure there is plenty of room for the mating RJ-45 connector and cable.
- 5) Do not use input voltage greater than 18 volts DC.
- 6) Screws for securing the unit are NOT provided with the DIS-III Lens Controller. Select screws that are consistent with the 0.11 inch mounting hole diameter.
- 7) The power must be off during installation or when cable connections are underway.
- 8) Be careful not to touch U8 while power is applied. U8 is a 3.3VDC regulator and will become very hot to the touch. Also keep wiring from touching U8.
- 9) J2 is for DC output power only. Do not confuse with J4 or J5 which are for video only
- 10) Do not connect the DC Power to J4 or J5.
- 11) Do not operate the control of the DIS-III Lens Controller under any circumstances while installation is underway.
- 12) Make sure the proper serial interface is selected by the Setup DIP Switches before connecting the serial control cable.

Dimensions below are in inches



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

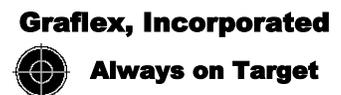
# Table of Contents

<b>1.0 Introduction</b> .....	<b>6</b>
<b>1.1 Safety Precautions</b> .....	<b>6</b>
<i>1.1.1 Operating Safety</i> .....	6
<b>1.2 Features and Capabilities</b> .....	<b>7</b>
<i>1.2.1 Salient Features</i> .....	7
<i>1.2.2 Block Diagram Discussion</i> .....	7
<b>2.0 Location and Function of Parts</b> .....	<b>8</b>
<b>2.1 Serial Communications Interface</b> .....	<b>8</b>
<b>2.2 Ethernet</b> .....	<b>9</b>
<b>2.3 Power</b> .....	<b>9</b>
<b>2.4 Setup Dip Switches</b> .....	<b>10</b>
<b>2.5 Microprocessor</b> .....	<b>11</b>
<b>2.6 Drive System</b> .....	<b>12</b>
<i>2.6.1 Zoom and Focus Control</i> .....	12
<i>2.6.2 Iris Control</i> .....	13
2.6.2.1 Auto/Manual Iris Mode .....	13
2.6.2.2 Standard Manual Iris Control .....	13
2.6.2.3 DC Iris Manual Control.....	13
<b>2.7 Video Routing</b> .....	<b>14</b>
<b>3.0 Setup and Operation</b> .....	<b>15</b>
<b>3.1 DIS-III Setup</b> .....	<b>15</b>
<i>3.1.1 Connector Wiring</i> .....	15
3.1.1.1 Zoom and Focus Feedback (J1).....	15
3.1.1.2 Power Output (J2).....	15
3.1.1.3 Power Input (J3) .....	15
3.1.1.4 Video Input and Video Output (J4 & J5) .....	15
3.1.1.5 Programming Connector (J6) .....	16

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



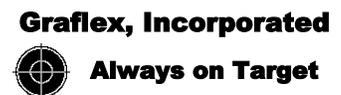
# Table of Contents-Continued

3.1.1.6.1 RS-232 Wiring .....	16
3.1.1.6.2 RS-422 Wiring .....	16
3.1.1.6.3 RS-485 Wiring .....	16
3.1.1.7 Iris (J8).....	17
3.1.1.7.1 Standard Iris Wiring.....	17
3.1.1.7.2 DC Iris Wiring .....	17
3.1.1.8 Auto Iris (J9).....	17
3.1.1.9 Zoom and Focus Motor Drive (J10).....	17
<b>3.1.2 Dip Switch Setup.....</b>	<b>18</b>
3.1.2.1 Iris Selection.....	18
3.1.2.2 Address .....	18
3.1.2.3 Serial Interface Selection.....	18
3.1.2.4 Protocol Selection.....	18
<b>3.2 Protocol Discussion.....</b>	<b>19</b>
<b>3.3 Ethernet Discussion .....</b>	<b>20</b>
<b>4.0 Basic Specifications .....</b>	<b>21</b>
<b>Appendix A: Drawings.....</b>	<b>22</b>
<b>Appendix A.1: Ethernet Crossover Cable .....</b>	<b>23</b>
<b>Appendix A.2: DIS-III PCB Silkscreen .....</b>	<b>24</b>
<b>Appendix A.3: Pelco D Commands.....</b>	<b>25</b>
<b>Appendix A.4: Visca Commands .....</b>	<b>26</b>
<b>Appendix A.5: DIS-II Commands .....</b>	<b>27</b>
<b>Appendix A.6: XPort Device Details and Installer Printout .....</b>	<b>28</b>

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## 1.0 Introduction

### 1.1 Safety Precautions

#### *1.1.1 Operating Safety*

Care must be taken when operating the DIS-III. Make sure to follow the basic safety instructions:

- Make sure the mounting area around the board is free of obstructions.
- The input voltage must be between 12 and 18 volts DC. Lower voltage could cause a degradation in performance.
- The Power Input Connector is J3. J2 is the power output connector.
- Only use J4 and J5 for video connections.
- Do not touch U8 while power is On. You may get burned.
- Power must be off during installation
- Make sure the proper serial interface is selected by the Setup DIP Switches. You may select RS-232, RS-422 or RS-485. Ethernet is always available.

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## 1.2 Features and Capabilities

### 1.2.1 Salient Features

The DIS-III board is designed to replace the DIS-II board. As a result it has the same physical footprint and mounting hole locations. The DIS-III allows serial interfacing via RS-232, RS-422 or RS-485 serial techniques. In addition, Ethernet is available also.

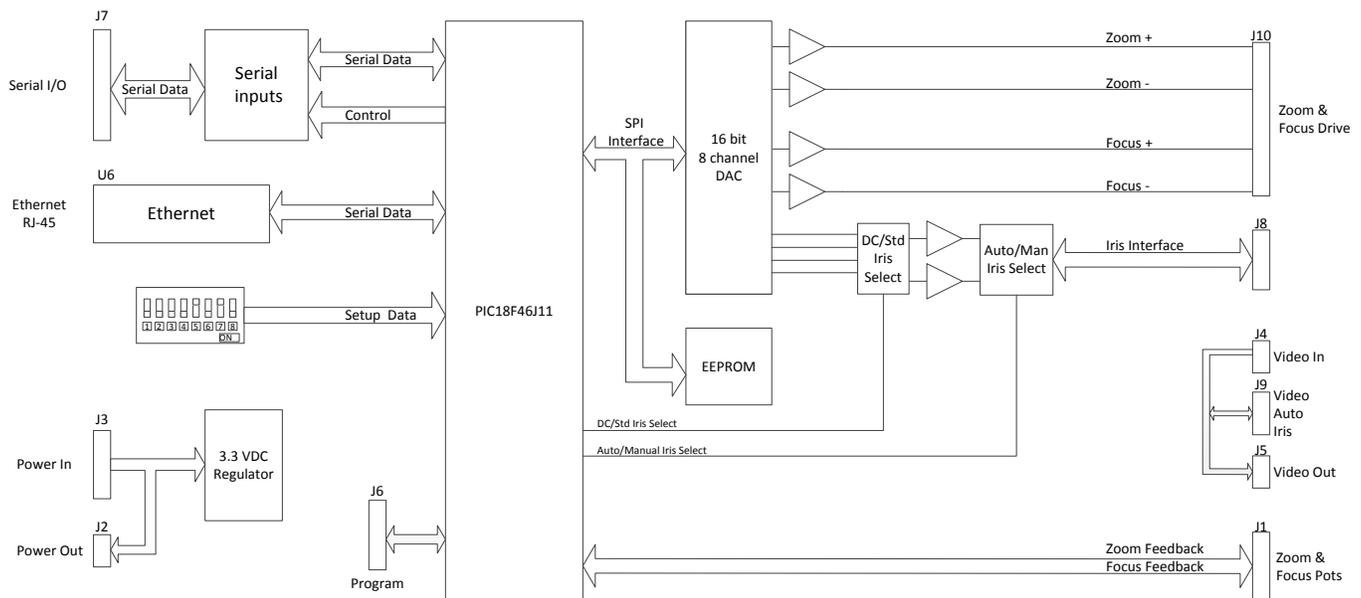
The DIS-III Board has its own DIS-III messaging protocol as well as the ability to message with the following protocols: DIS-II, Visca, Pelco-D. The commands accepted from each of these protocols will be discussed later in this manual. The DIS-III protocol has its own dedicated Interface Protocol Manual.

### 1.2.2 Block Diagram Discussion

The DIS-III Block Diagram is shown below. The Block Diagram consists of the following major areas.

- **Communications Interface:** The serial I/O connector (J7), serial receiver/driver and the Ethernet connector/processor.
- **Power Circuitry:** Regulates +12 VDC to 3.3VDC for on board processing.
- **Setup Dip Switches.**
- **Processor & Support:** Includes the processor, EEPROM and the zoom and focus feedback connector (J1). The programming connector (J6) is also included.
- **Drive System:** Includes the 16-bit DAC, zoom & focus drive amplifiers, iris control and iris drive.
- **Video Routing:** Includes J4, J5 and J9. J4 and J5 are simply video in and out while J9 also has +12 VDC and ground to interface to a video auto iris board.

Each of these areas will be discussed in more detail in paragraph 2.0



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

## 2.0 Block Diagram Discussion

A detailed discussion of each of the major block diagram areas is presented below.

### 2.1 Serial Communications Interface

The serial input is via a 6 pin Molex connector (J7) that is used to interface a controller or computer to the DIS-III. The inputs and outputs of the serial interface are protected from interface disturbances by transient voltage suppressor diodes. The multiprotocol transceivers are made by Linear Technology and are part number LTC2870. From the LTC2870 the signal enters the processor as COMM 1 and is used to control the actions of the DIS-III.

Note the serial interface technique **MUST** be set by the Setup Dip Switches as described below:

- RS-232: DSW5 = ON or OFF and DSW6 = ON
- RS-422: DSW5 = ON and DSW6 = OFF
- RS-485: DSW5 = OFF and DSW6 = OFF

Make sure the J7 connector interface wiring is consistent with the serial selection. In other words, do not set the Setup Dip Switches for RS-422 and connect to an RS-232 source. The proper connections to J7 are as follows:

- RS-232: J7-1 Receive Input; J7-5 Transmit Out, J7-6 Ground
- RS-422: J7-1 Receive Input+ (Full Duplex)  
J7-2 Receive Input-  
J7-5 Transmit Out+  
J7-4 Transmit Out-  
J7-6 Ground
- RS-485: J7-5 Receive+/Transmit Out+  
J7-4 Receive-/Transmit Out-  
J7-6 Ground

J7 is shown below and is located adjacent to the Lantronix XPort.

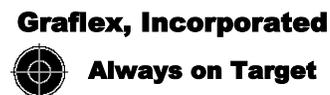


Pin 1

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## 2.2 Ethernet Interface

With this option, an Ethernet capability is provided. The Ethernet interface is done via a Lantronix XPORT combination RJ-45 receptacle and Ethernet server. The output of the XPort is a serial output that will directly interface to the processor as COMM 2. The same protocol that was selected for the serial input via Comm 1 is applicable to Comm 2.

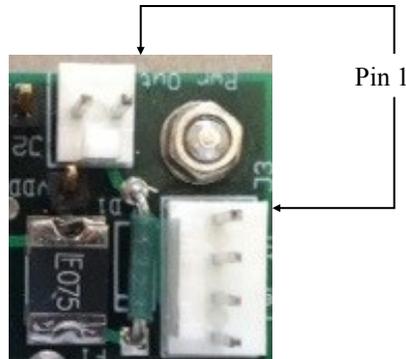
The Lantronix XPort must be initially setup with the Lantronix DeviceInstaller software. The XPort is initially set to an IP address of 192.168.0.146, Subnet Mask of 255.255.255.0, port of 80 and Channel 1 Baud rate of 19200. The Lantronix XPort is shown below:



When communicating to a network, use a standard Ethernet cable. When communicating directly to a local computer, a crossover cable is required. The Appendix A.1 illustrates the Ethernet crossover cable wiring.

## 2.3 Power

The power is input through a 4 pin Molex connector (J3). In addition, there is a power output connector (J2) available as shown in the photo below. The +12 VDC power input is regulated to 3.3VDC for use throughout the board.



Pin 1 is shown for both the power input connector (J3) and the power output connector (J2). The signal connections are listed below.

### J3 Power Input

Pin 1: Ground  
Pin 2: Ground  
Pin 3: +12 VDC  
Pin 4: +12 VDC

### J2 Power Output

Pin 1: Ground  
Pin 2: +12 VDC

For further information, contact:

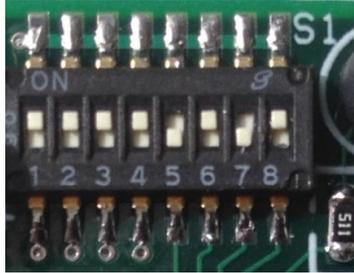
Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

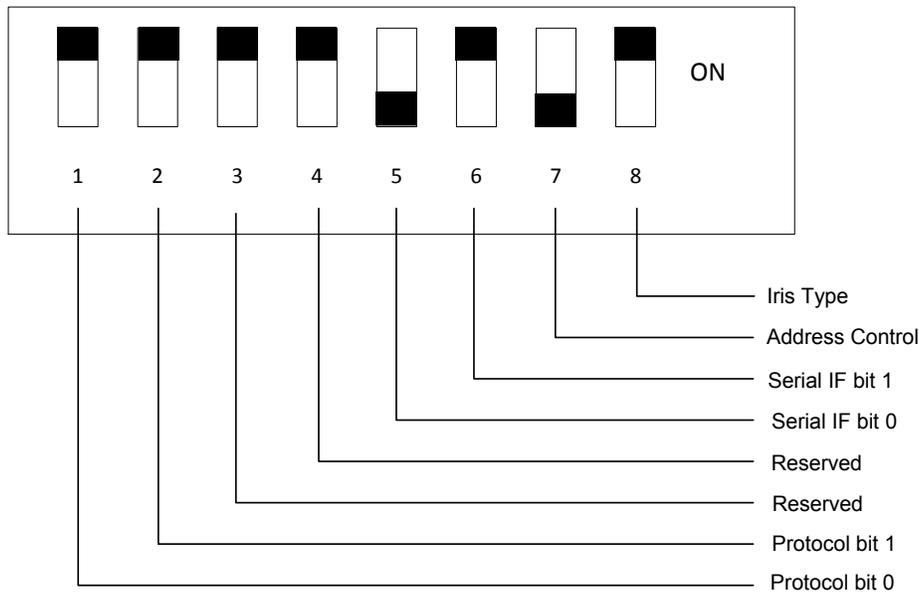
**Graflex, Incorporated**  
 **Always on Target**

## 2.4 Setup Dip Switches

The Setup Dip Switches are used to enable dedicated board functions and to allow some functions to be controlled by external software. A photo of the Setup Switch is shown below with the switches in the default configuration.



More detail on the Setup Dip Switches is presented below.



<b>Protocol</b>	<b>DSW1</b>	<b>DSW 2</b>	<b>Address</b>	<b>DSW7</b>
DIS-III	On	On	ON: Address is 0x01	
Pelco D	Off	On	OFF: Address set by remote GUI	
Visca	On	Off		
DIS-II	Off	Off		
<b>Not Used</b>	<b>DSW3</b>	<b>DSW4</b>	<b>Iris</b>	<b>DSW8</b>
			ON: Video Iris	
			OFF: DC Iris	
<b>Serial Interface</b>	<b>DSW5</b>	<b>DSW6</b>		
RS-232	On	On		
RS-232	Off	On		
RS-422	On	Off		
RS-485	Off	Off		

For further information, contact:

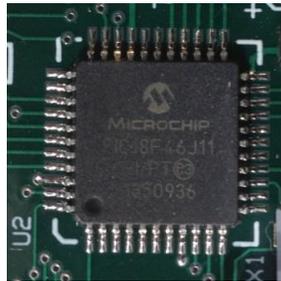
Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## 2.5 Microprocessor

The heart of the system is a Microchip PIC18F46J11 processor. The processor controls all of the board internal functions and interfaces with the outside world via the serial and Ethernet connections. The processor stores all of the user defined variables in a 25LC256 EEPROM. These commands are received via the DIS-III Graphical User Interface (GUI). The processor continuously monitors the Setup Dip Switches for specific board unique setup requirements that are not desirable for GUI setup. The Processor is shown below:



The connector used to program the processor is shown below and is not intended for end user use.



The primary function of the processor is to control the signals going to the zoom, focus and iris motors of the lens. The processor receives commands from the GUI along with zoom and focus feedback to properly control and drive the zoom, focus and iris motors.

The processor is programmed to respond to several different lens control protocols. The processor receives the messages and converts the messages from a serial protocol to drive and control signals that are used to by the motor controllers. The processor also has a built-in 10 bit Analog-to-Digital converter that receives feedback voltage signals from the lens zoom and focus potentiometers and converts them to digital position signals to be used by the processor. The zoom and focus feedback connector is shown below:



Pin 1

### J1 Potentiometer Interface

- Pin 1: Focus Potentiometer Wiper
- Pin 2: Focus Potentiometer Ground
- Pin 3: Focus Potentiometer +3.3VDC
- Pin 4: Zoom Potentiometer Wiper
- Pin 5: Zoom Potentiometer Ground
- Pin 6: Zoom Potentiometer +3.3VDC

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

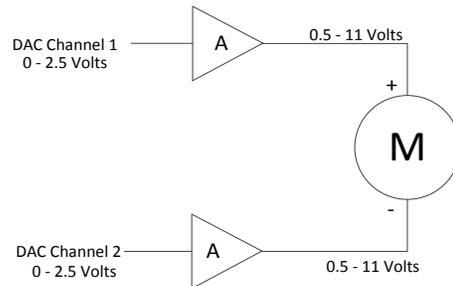
**Graflex, Incorporated**  
 **Always on Target**

## 2.6 Drive System

The drive system provides the circuitry required to control the zoom, focus and iris motors. The control of the zoom and focus motors is virtually identical and will be discussed together but the iris control requires a separate discussion. The analog drive signals that are used for motor control is derived from a Linear Technology LTC2600 Digital to Analog converter. The LTC2600 has 8 separate 16 bit analog outputs and is controlled by the processor via a SPI serial interface.

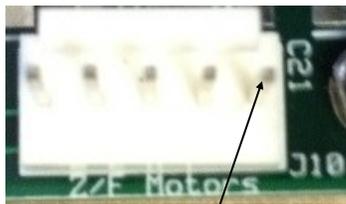
### 2.6.1 Zoom and Focus Motor Control

The zoom and focus motor drive each consist of 2 each TCA0372 amplifiers. One each for each side of the motor. As a result, each motor has 2 DAC channels dedicated to its drive. The drive signals are 0 to 2.5 VDC in increments of 0.04 millivolts per increment for each side of the motor as shown below. To drive the motor one side of the motor has 0 volts applied from the DAC while the other has a higher voltage applied that is proportional to the desired motor speed.



To drive the motor in the opposite direction, simply reverse voltage levels. As seen in the motor drawing above, the amplifier increases the 0 to 2.5 volts from the DAC to 0.5 to 11.0 volts which is applied to the motor windings. This approach is true for both zoom and focus motor drives.

The photo below shows the zoom and focus motor connector and the accompanying chart defines the signals on each pin.



Pin 1

#### J10 Zoom/Focus Drive Output

- Pin 1: Zoom +
- Pin 2: Zoom -
- Pin 3: Ground
- Pin 4: Focus +
- Pin 5: Focus -

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

## 2.6.2 Iris Control

The DIS-III can control both a standard video iris and a DC iris lens. As a result there are 4 DAC channels dedicated to the iris drive circuitry. Furthermore, the iris may operate in either an auto or manual iris mode. The DIS-III can accommodate all of these modes. We will discuss each of the modes separately.

- 2.6.2.1 Auto/Manual Iris mode: The DIS-III board creates a manual iris control mode for both video and DC iris lenses. Auto iris is generated by either the camera (in DC iris) or a video auto iris that normally originates in the lens.

Paragraph 2.4 described Setup Dip Switch 8 (DSW8) as the switch that selects either DC iris or video iris. In either mode, an auto iris signal is remotely generated and sent to the DIS-III board. When the board is in the auto iris mode, this signal is simply routed to the lens. But when in the manual iris mode, either a manually generated motor drive iris (Video iris) or DC iris signal is sent to the lens. The auto/manual iris command is received via serial or Ethernet messaging and used to control the iris signal sent to the lens.

- 2.6.2.2 Standard Manual Iris Control. When the standard iris control mode is selected (Video iris) from DSW8, an iris signal is generated in the same manner as the zoom and focus signals are generated. These manual iris signals are to be used to directly drive a motor in the same manner as the zoom or focus motors.

- 2.6.2.3 DC Iris Manual Control: These lenses use a galvanometric iris control and the cameras will typically have the auto iris circuitry built into them. The challenge is to control the DC iris manually. The DC iris makes use of 2 different coils. One is a drive coil and the other is a sensing, or control, coil. The control coil detects the motion and creates a damping signal that can be processed to smoothly control the movement of the iris. During auto iris, other factors interact with the process. These include automatic gain or aperture control signals that work in conjunction with the control coil to perform the auto iris function.

In manually controlling the DC iris, we must also use the control coil. We use the damping voltage as feedback control of the iris. The DC and standard iris share the same connector which is shown below.



Pin 1

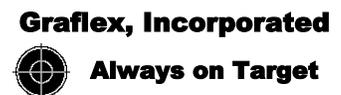
### J8 Iris Connector

- Pin 1: Control - from DC Iris
- Pin 2: Control + from DC Iris
- Pin 3: Control + to Camera
- Pin 4: Control - to Camera
- Pin 5: Camera/Auto Iris Drive +
- Pin 6: Camera/Auto Iris Drive -
- Pin 7: Iris Drive -
- Pin 8: Iris Drive +

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

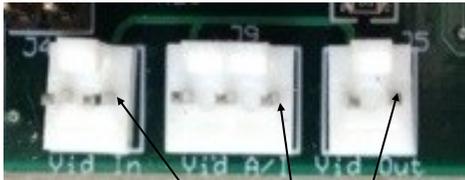


## 2.7 Video Routing

There are 3 video connections on the DIS-III board: J4, J5 and J9. J4 and J5 are simply video input and video output connectors. J4 has been designated as the video input and J5 as the video output. In reality, they are wired directly to each other and either can be the video input or video output.

J9 is the video auto iris connector and is used to route a video signal from the camera to the lens auto iris circuitry. This connector is not used with a DC iris lens. Again the video and video ground are common with video connectors J4 and J5.

The three connectors are shown below and the wiring for each connector is also shown. The video grounds are isolated from the board but may be grounded to the board signal ground by shorting pins 1 and 2 of jumper JP1. A DC iris would not require the use of J4, J5 or J9. but a standard iris may require the jumper pins to be shorted.



Pin 1

### **J4 Video Connector**

Pin 1: Video Ground  
Pin 2: Video

### **J5 Video Connector**

Pin 1: Video Ground  
Pin 2: Video

### **J9 Video Connector**

Pin 1: +12 VDC  
Pin 2: Ground  
Pin 3: Video

**IMPORTANT:** Do not connect the 2 pin power cable to J4 or J5. Camera go BOOM.

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

## 3.0 Setup and Operation

The setup and operation of the DIS-III is presented below.

### 3.1 DIS-III Setup

In preparing to use the DIS-III, several cables must be made to interface the DIS-III to the lens. The type of lens and the serial interface are important.

#### 3.1.1 Connector Wiring

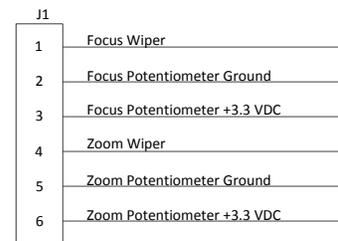
This section will present the part numbers and the wiring of all necessary connectors. The contact pins are Molex Part Number 08-50-0114. The crimping tool required to attach the wire (AWG 22 - AWG 26) to the contact pin is Molex Part Number 11-01-0185.

##### 3.1.1.1 Zoom and Focus Feedback (J1) - 6 Pin Molex

Mating Connector: Molex 22-01-3067

Note: Depending on the gearing of the lens, the focus and zoom Ground and 3.3 VDC lines may need to be reversed.

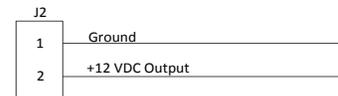
*Warning: The Serial IO (J7) is also a 6 pin Molex connector. Do not connect the cable for J1 to J7 nor the cable for J7 to J1.*



##### 3.1.1.2 Power Output (J2) - 2 Pin Molex

Mating Connector: Molex 22-01-3027

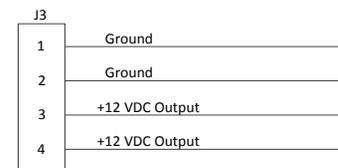
*Warning: The Video Input (J4) and Video Output (J5) are also 2 pin Molex connectors. Do not attach the power cable to J4 or J5 connection and do not connect the video cables to J2*



##### 3.1.1.3 Power Input (J3) - 4 Pin Molex

Mating Connector: Molex 22-01-3047

It is preferable to use a heavier gauge wire for DC Power input. AWG 22 is recommended.



##### 3.1.1.4 Video Input (J4) and Video Output (J5) - 2 Pin Molex

Mating Connector: Molex 22-01-3027

Note: Many configurations will not use J5

*Warning: The Power Output (J2) connector is also 2 pin Molex connector. Do not attach the power output cable to J4 or J5 connectors and do not connect a video cable to J2.*



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

### 3.1.1.5 Programming Connector (J6)

Used by the manufacture to program the board.

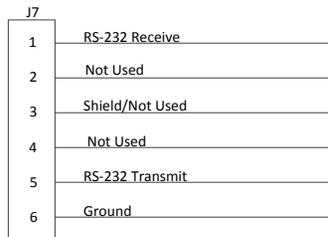
### 3.1.1.6 Serial IO (J7) - 6 Pin Molex

Mating Connector: Molex 22-01-3067

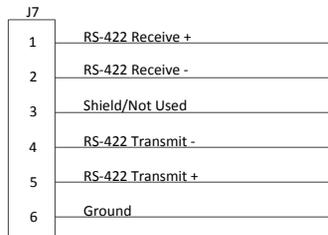
*Warning: The Zoom and Focus Feedback (J1) is also a 6 pin Molex connector. Do not connect the cable for J1 to J7 nor the cable for J7 to J1.*

The wiring of this connector is dependent upon which serial interface protocol is being used. The RS-232, RS-422 and RS-485 J7 wiring is presented below.

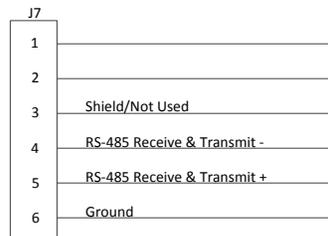
#### 3.1.1.6.1 RS-232 Wiring



#### 3.1.1.6.2 RS-422 Wiring



#### 3.1.1.6.3 RS-485 Wiring



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



### 3.1.1.7 Iris (J8) - 8 Pin Molex

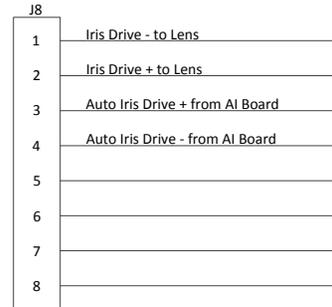
Mating Connector: Molex 22-01-3087

The wiring of this connector is dependent upon which iris configuration is being used. Wiring for the Standard Video Iris and the DC Iris are presented below

#### 3.1.1.7.1 Standard Iris Wiring

The Auto Iris Drive from the Auto Iris board is based up on a Video Auto Iris. The video interface to the Video Auto Iris is shown in paragraph 3.1.1.8. When the DIS-III is in the manual iris mode, the auto iris drive signals are replaced with iris drive signals generated on the DIS-III board.

If a lens has no auto iris, pins 3 and 4 will not be used and the manual iris signal will be used.



#### 3.1.1.7.2 DC Iris Wiring

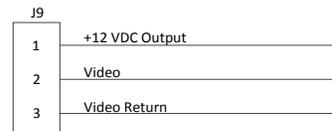
When a DC Iris is used, the control coil signals are required for use by both the auto iris camera functions and the DIS-III manual iris/.



### 3.1.1.8 Auto Iris Input (J9) - 3 pin Molex

Mating Connector: Molex 22-01-3037

The Auto Iris Input provides the video and power to the video auto iris circuitry located in the lens or camera.



### 3.1.1.9 Zoom & Focus Motor Drive (J10) - 5 pin Molex

Mating Connector: Molex 22-01-3057

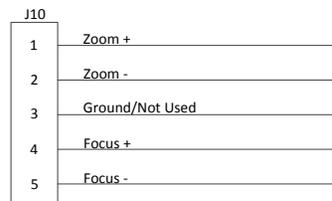
The polarity is typically:

**J10 Zoom Tele**  
Pin 1: + Voltage  
Pin 2: Ground

**J10 Focus Far**  
Pin 4: + Voltage  
Pin 5: Ground

**J10 Zoom Wide**  
Pin 1: Ground  
Pin 2: +Voltage

**J10 Focus Near**  
Pin 4: Ground  
Pin 5: +Voltage



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



### 3.1.2 Dip Switch Setup

The Setup Dip Switches have already been described in paragraph 2.4. This paragraph will present what Setup Dip Switches are used for normal operation. At this point all of the cables should have been made and connected to the DIS-III but power not yet applied.

#### 3.1.2.1 Iris Selection

It is critical to select the proper iris configuration prior to applying to the DIS-III. The iris is controlled by Setup Dip Switch 8 (DSW8).

<b>Iris</b>	<b>DSW8</b>
ON:	Video Iris
OFF:	DC Iris

#### 3.1.2.2 Address

Two of the four protocols require an address. This is to allow them to be operated on an RS-485 in the half duplex mode. This means that the receive and transmit signals are on the same pins. There are two selections for the address that are selectable via Setup Dip Switch 7 (DSW7). It is recommended that DSW7 be OFF to allow the address be set by the Graphical User Interface (GUI). The default address for the GUI is also "1".

<b>Address</b>	<b>DSW7</b>
ON:	Address is 0x01
OFF:	Address set by remote GUI

#### 3.1.2.3 Serial Interface Selection

If the serial interface is to be used, the serial interface MUST be selected with Setup Dip Switch 5 (DSW5) and Setup Dip Switch 6 (DSW6). The selection is made by a GUI because once the selection is made, it can only be changed by using the interface selected interface. If the selection was made by the GUI in error, there would be no way to correct the error. The default selection is RS-232.

<b>Serial Interface</b>	<b>DSW5</b>	<b>DSW6</b>
RS-232	On	On
RS-232	Off	On
RS-422	On	Off
RS-485	Off	Off

#### 3.1.2.4 Protocol Selection

The default protocol selection is the DIS-III protocol. This protocol must be used in conjunction with the DIS-III GUI to setup lens variables. After the lens setup is complete, the protocol may be changed by the DIS-III GUI to any of the other protocols.

<b>Protocol</b>	<b>DSW1</b>	<b>DSW 2</b>
DIS-III	On	On
Pelco D	Off	On
Visca	On	Off
DIS-II	Off	Off

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

## 3.2 Protocol Discussion

It is appropriate to take a minute to discuss the various protocols available for controlling the DIS-III. As mentioned in the previous paragraph, the native protocol is the DIS-III protocol. This protocol was developed to take full advantage of the DIS-III lens control features. These features include:

- Setting the Maximum Zoom Speed
- Setting the Minimum Zoom Speed
- Setting the Maximum Focus Speed
- Setting the Minimum Focus Speed
- Setting the Manual Iris Speed
- Setting the DC Iris Offset
- Setting the DC Iris Position
- Setting the lens motion timeout value
- Independently reversing the polarity of zoom, focus or iris
- Determining the zoom and focus feedback potentiometer range

After the DIS-III has been configured and the various lens variables set, any of the 4 protocols may be selected for controlling the DIS-III. The protocols may be selected by the GUI if DSW 1 and DSW 2 are both ON. If a single protocol is going to be used, it is better to use the Setup Dip Switches to select a protocol.

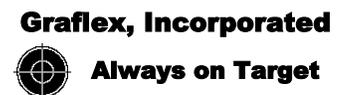
Appendix A.3, A.4 and A.5 list the commands available from each of the listed protocols for controlling the DIS-III. A separate “DIS-III Interface Protocol Manual” is available from Graflex, Inc. that details the native DIS-III protocol commands and return messages.

- Appendix A.3: Pelco D Commands
- Appendix A.4: Visca Commands
- Appendix A.5: DIS-II Commands

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



### 3.3 Ethernet Discussion

The Ethernet option allows the DIS-III to be controlled over an Ethernet network. The Ethernet capability is provided by an XPort Ethernet processor. The XPort interfaces with the Ethernet and provides serial data to the DIS-III microprocessor. When this option is purchased, the DIS-III will have the following network variables:

IP Address: 192.168.0.146

Subnet Mask : 255.255.255.0

Port: 80

Channel 1 Baud rate: 19200

These settings may be changed by the Lantronix DeviceInstaller software that is available from Graflex, Inc. or from the Lantronix website. Appendix A.6 shows a typical XPort setup.

To learn more about the XPort and the DeviceInstaller visit see the following Lantronix website Document Resources:

Home Website: [www.lantronix.com](http://www.lantronix.com)

XPort Document Page: [www.lantronix.com/support/downloads/?p=XPORT](http://www.lantronix.com/support/downloads/?p=XPORT)

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## 4.0 Basic Specifications

### Characteristics:

Dimensions .....	2.5”(w) x 3.8” (d) x 0.625” (h)
Weight .....	0.09 Pounds
Operating Temperature.....	-20 to 85 degrees C

### Electrical:

Voltage .....	+12 VDC nominal
Current.....	0.250 Amps

### Communications:

Serial Interface: .....	RS-232, RS-422 or RS-485
Ethernet.....	10Base-T/100Base-TX
Control Protocols.....	via serial commands
DIS-III	
Pelco D	
Visca	
DIS-II	

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## **Appendix A**

**A.1 Ethernet Crossover Cable wiring**

**A.2 DIS-III PCB Silkscreen**

**A.3 Pelco D Commands**

**A.4 Visca Commands**

**A.5 DIS-II commands**

**A.6 XPort Device Details and Installer printout**

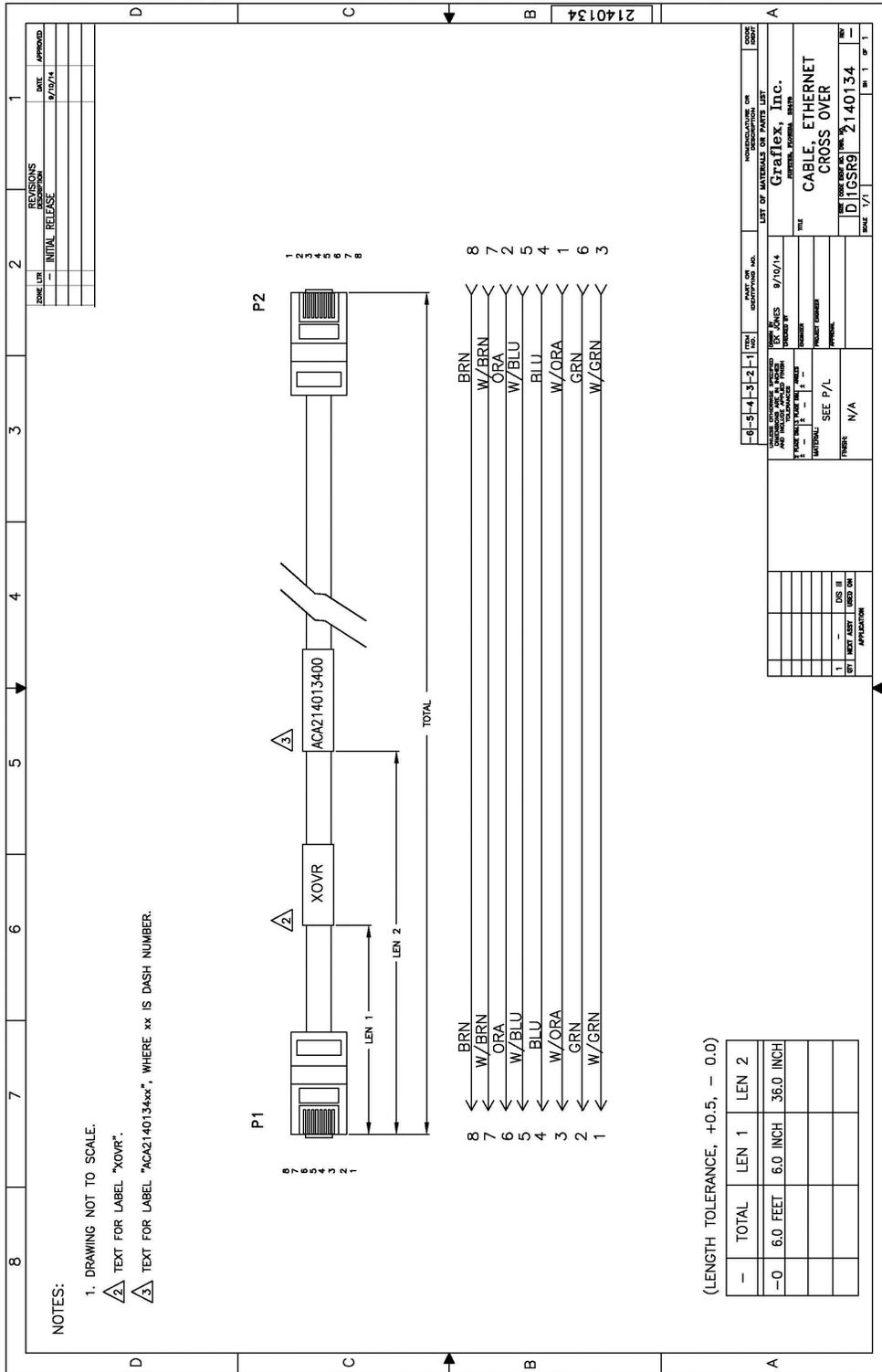
For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



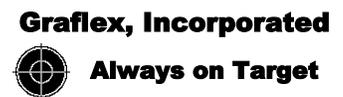
# A.1 Ethernet Crossover Cable wiring



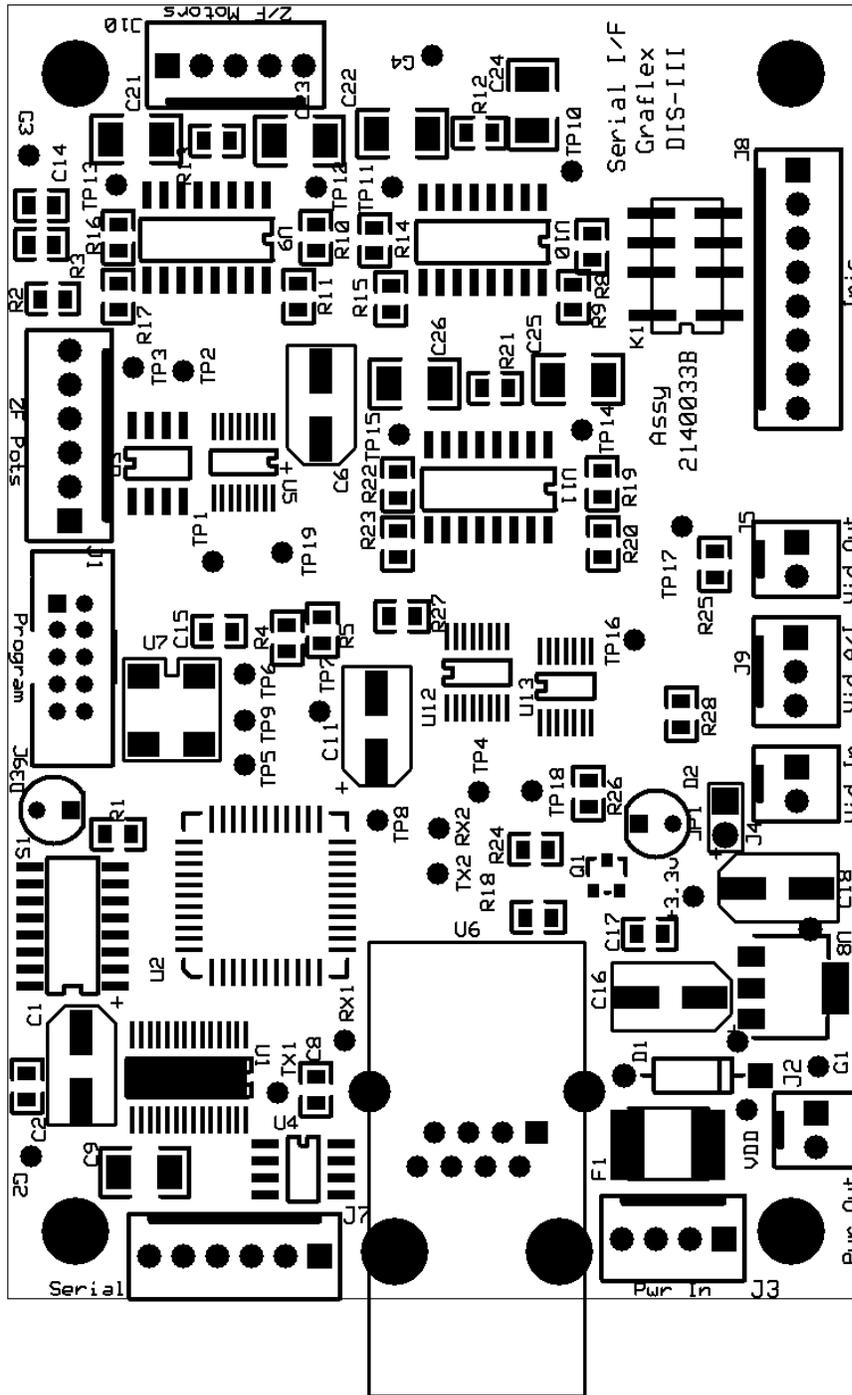
For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
 email: Sales@Graflex.com

Graflex, Incorporated  
 15855 Assembly Loop, Suite 100  
 Jupiter, Florida 33478 USA



## A.2 DIS-III PCB Silkscreen



For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

### A.3 Pelco D Protocol Commands

#### Standard Commands:

Zoom Tele  
Zoom Wide  
Zoom Stop  
Focus Near  
Focus Far  
Focus Stop  
Iris Open  
Iris Close  
Iris Stop

#### Extended Commands

Set Preset  
Goto Preset  
Set Zoom Speed  
Set Focus Speed  
Auto Iris On/Off

#### Advanced Commands

Set Zoom Position (Linear potentiometer response)  
Query Zoom Position (Linear potentiometer response)  
Query Version  
Query Build  
(Both Version & Build are required to return DIS-III Version)

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## A.4 Visca Protocol Commands

### Commands:

- Zoom Tele Variable
- Zoom Wide Variable
- Zoom Stop
- Focus Near Variable
- Focus Far Variable
- Focus Stop
- Iris Open (Up)
- Iris Close (Down)
- Iris Stop
- Iris Full Auto (Auto Iris)
- Iris Priority (Manual Iris)
- Zoom Position Direct
- Focus Position Direct
- Set Zoom Speed
- Set Focus Speed
- Auto Iris On/Off

### Query

- Query Zoom Position
- Query Focus Position
- Query Version

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## A.5 DIS-II Protocol Commands

### Commands:

- Zoom Tele
- Zoom Wide
- Zoom Stop
- Focus Near
- Focus Far
- Focus Stop
- Iris Open
- Iris Close
- Iris Stop
- Iris Auto/Manual
- Speed
  - Low
  - Medium
  - High

### Query

- Query Zoom Position
- Query Focus Position
- Query Version

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: [Sales@Graflex.com](mailto:Sales@Graflex.com)

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## A.6 XPort Device Details

Property	Value
Name	XPort-05
DHCP Device Name	
Group	
Comments	
Device Family	XPort
Type	XPort-05
ID	X9
Hardware Address	00-80-A3-92-91-DB
Firmware Version	6.9
Extended Firmware Version	6.9.0.2
Online Status	Online
IP Address	192.168.0.146
IP Address was Obtained	Statically
Subnet Mask	255.255.255.0
Gateway	0.0.0.0
Number of COB partitions supported	6
Number of Serial Ports	1
TCP Keepalive	45
Telnet Supported	True
Telnet Port	9999
Web Port	80
Maximum Baud Rate Supported	921600
Firmware Upgradable	True
Supports Configurable Pins	True
Supports Email Triggers	True
Supports AES Data Stream	True
Supports 485	True
Supports 921K Baud Rate	True
Supports HTTP Server	True
Supports HTTP Setup	True
Supports 230K Baud Rate	True
Supports GPIO	True

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA



## A.6 XPort Device Installer printout (page 1)

MAC address 0080A39291DB  
Software version V6.9.0.2 (130207) XPTEXE  
AES library version 1.8.2.1

Press Enter for Setup Mode

\*\*\* basic parameters  
Hardware: Ethernet TPI  
IP addr 192.168.0.146, no gateway set, netmask 255.255.255.0  
DNS Server not set  
DHCP FQDN option: Disabled

\*\*\* Security  
SNMP is enabled  
SNMP Community Name: public  
Telnet Setup is enabled  
TFTP Download is enabled  
Port 77FEh is enabled  
Web Server is enabled  
Web Setup is enabled  
ECHO is disabled  
Encryption is disabled  
Enhanced Password is disabled  
Port 77F0h is enabled

\*\*\* Channel 1  
Baudrate 19200, I/F Mode 4C, Flow 00  
Port 00080  
Connect Mode : C0  
Send '+++ ' in Modem Mode enabled  
Show IP addr after 'RING' enabled  
Auto increment source port disabled  
Remote IP Adr: --- none ---, Port 00000  
Disconn Mode : 00  
Flush Mode : 00

\*\*\* Expert  
TCP Keepalive : 45s  
ARP cache timeout: 600s  
CPU performance: Regular  
Monitor Mode @ bootup : enabled  
RS485 tx enable : active low  
HTTP Port Number : 80  
SMTP Port Number : 25  
MTU Size: 1400  
TCP Re-transmission timeout: 500 ms  
Alternate MAC: disabled  
Ethernet connection type: auto-negotiate

\*\*\* E-mail  
Mail server: 0.0.0.0  
Unit :  
Domain :  
Recipient 1:  
Recipient 2:

- Trigger 1  
Serial trigger input: disabled  
Channel: 1  
Match: 00,00  
Trigger input1: X  
Trigger input2: X  
Trigger input3: X  
Message :  
Priority: L  
Min. notification interval: 1 s  
Re-notification interval : 0 s

- Trigger 2  
Serial trigger input: disabled  
Channel: 1  
Match: 00,00  
Trigger input1: X  
Trigger input2: X  
Trigger input3: X  
Message :

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

**Graflex, Incorporated**  
 **Always on Target**

## A.6 XPort Device Installer printout (page 2)

```
Priority: L  
Min. notification interval: 1 s  
Re-notification interval : 0 s
```

```
- Trigger 3  
Serial trigger input: disabled  
Channel: 1  
Match: 00,00  
Trigger input1: X  
Trigger input2: X  
Trigger input3: X  
Message :  
Priority: L  
Min. notification interval: 1 s  
Re-notification interval : 0 s
```

```
Change Setup:  
0 Server  
1 Channel 1  
3 E-mail  
5 Expert  
6 Security  
7 Defaults  
8 Exit without save  
9 Save and exit           Your choice ?
```

For further information, contact:

Voice: 561-691-5959; Fax 561-691-5983  
email: Sales@Graflex.com

Graflex, Incorporated  
15855 Assembly Loop, Suite 100  
Jupiter, Florida 33478 USA

