

SCHILLING  
ROBOTICS

# Wrist Camera Kit

**Models 101-5074 (NTSC), 101-5074-1  
(PAL)**



*Technical Manual*

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<b>TECHNICAL MANUAL REVISION LOG</b>		
<b>PRODUCT: Wrist Camera 101-5074-1 (PAL) &amp; 101-5074 (NTSC)</b>		
<b>TECHNICAL MANUAL: 011-9645</b>		
<b>Description</b>	<b>Date</b>	<b>Rev.</b>
Prototype release	02/12/06	Ø
Production release	06/07/06	<b>A</b>
Revision (reorganize installation section)	04/23/07	<b>B</b>
Revision (add instructions for removing camera)	10/31/08	<b>C</b>



# Wrist Camera Installation & Operation

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- 5 Removing the Camera .....page 7
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## 1 Overview

The wrist camera kit 101-5074-1 (PAL) or 101-5074 (NTSC) is mounted to the yaw actuator, replacing the top wire cover plate. Video coax cables 101-5159 and 005-4948 are connected between the SeaNet penetrator on the upper arm and the camera. Camera control harness 101-5158 is connected between the camera and the in-arm electronics PCB in the forearm. Installing the coax and harness requires draining the compensation fluid from the slave arm and removing all wire cover plates.

## 2 Preparing for Installation

Before installing the wrist camera:

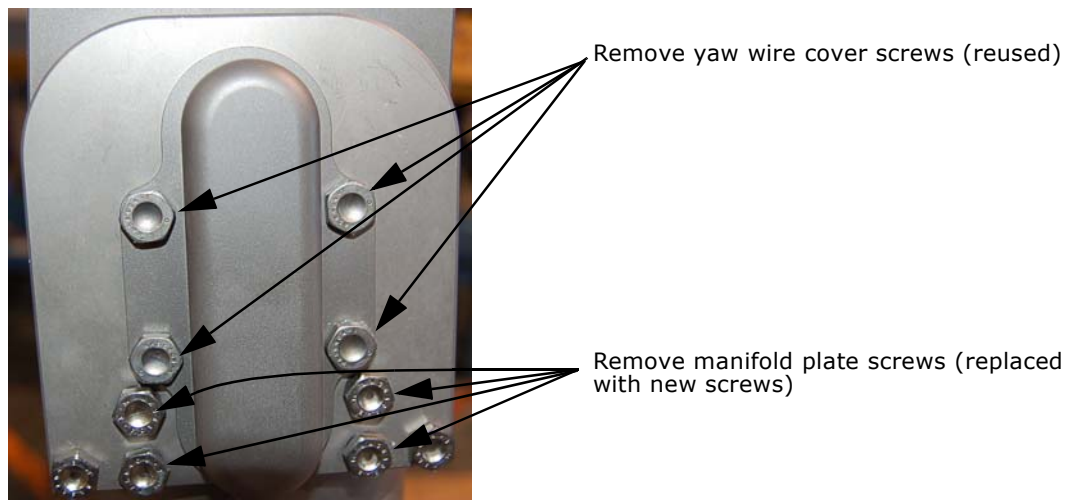
- Disconnect hydraulic and electrical power to the manipulator system.
- Drain the compensation fluid from the slave arm.

## 3 Installing the Wrist Camera

To install the wrist camera, follow the steps below.

1. Remove the four wire cover screws securing the top yaw wire cover and save for step 10. See [Figure 1](#).
2. Remove the four manifold plate screws securing the manifold plate. These screws will **not** be reused for camera installation.

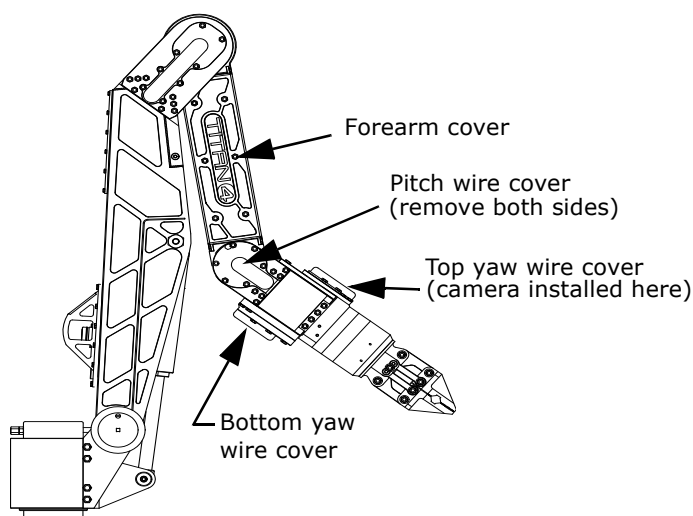
- Wrist Camera Installation & Operation



**Figure 1** Yaw wire cover plate and manifold plate screws

**Note:** Retain the original yaw wire cover, o-ring, and manifold screws for re-installation of the yaw wire cover if the camera is removed.

3. Remove the remaining forearm, pitch, and bottom yaw wire covers to aid in routing the new video coax cable and power harness. See [Figure 2](#).

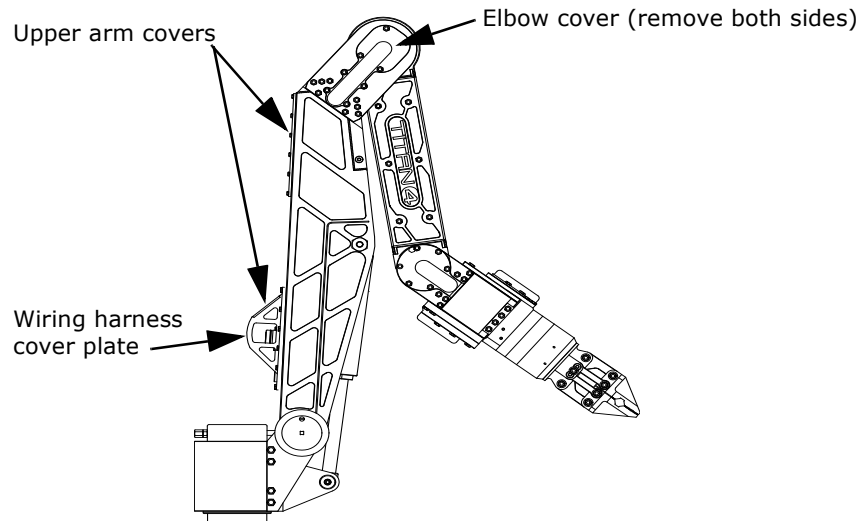


**Figure 2** Forearm, pitch, and yaw wire covers

4. Determine if a video coax cable is present in forearm. The coax connector is covered with white shrink tubing. Note: A video cable was not part of the wiring harness in early Titan 4 models.
  - If a video cable is present, cut off white shrink tubing and skip to step [h](#).
  - If a video cable is **not** present continue with step [a](#) to install the upper arm video cable 101-5159.

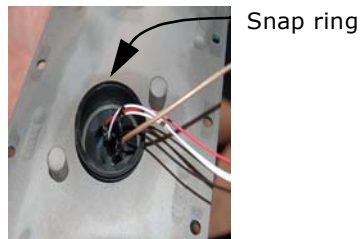
# Wrist Camera Installation & Operation •

- a. Remove the screws securing the wiring harness and upper arm cover plates. See [Figure 3](#). Carefully separating the covers from the upper arm to avoid damaging the harness wires.



**Figure 3** Upper arm, wiring harness and elbow covers

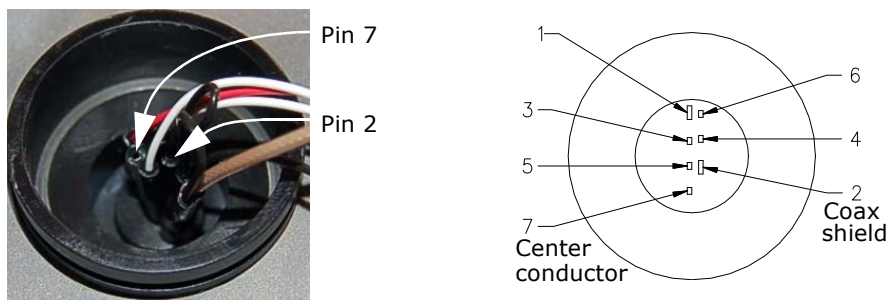
- b. From the back side of the wiring harness cover plate, remove the snap ring ([Figure 4](#)) from inside the penetrator housing.



**Figure 4** Snap ring

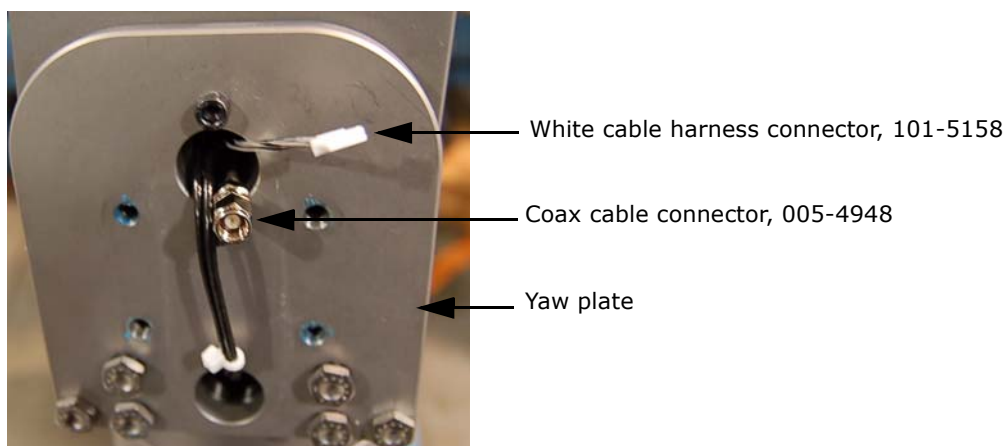
- c. Pull the inner connector assembly and harness out of the penetrator housing.
- d. Solder the coax center conductor wire to Pin 7 on the wiring harness connector. See [Figure 5](#).
- e. Solder the shield wire from the coax to Pin 2 on the wiring harness connector.

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**Figure 5** Coax solder connections

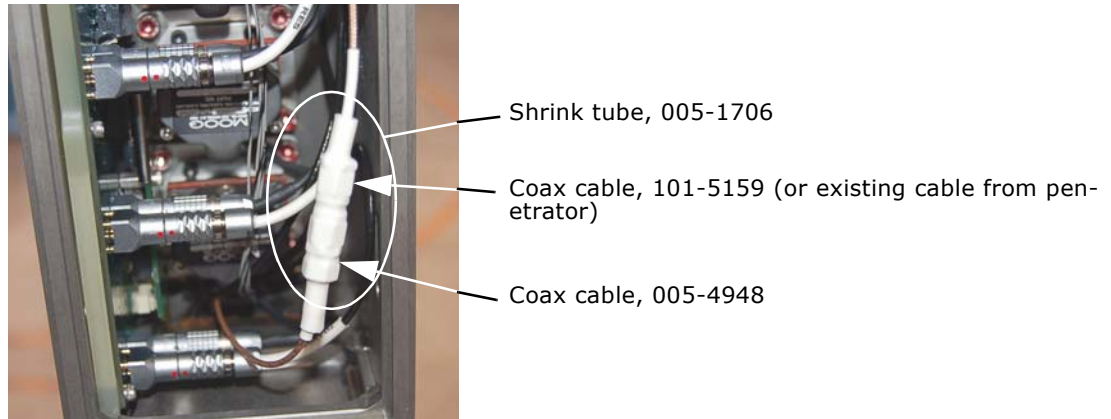
- f. Route the coax cable 101-5159 from the SeaNet penetrator up inside and through the upper arm, through the elbow, and then down into the forearm.
- g. To reassemble the connector, slide the inner SeaNet penetrator assembly into the penetrator housing on the wiring harness cover panel and install the snap ring.
- h. Starting in the forearm, feed the coax cable 005-4948 out of the forearm, through the pitch and yaw actuators, and then out the top yaw plate. See [Figure 6](#).



**Figure 6** Camera cable at yaw camera mounting location

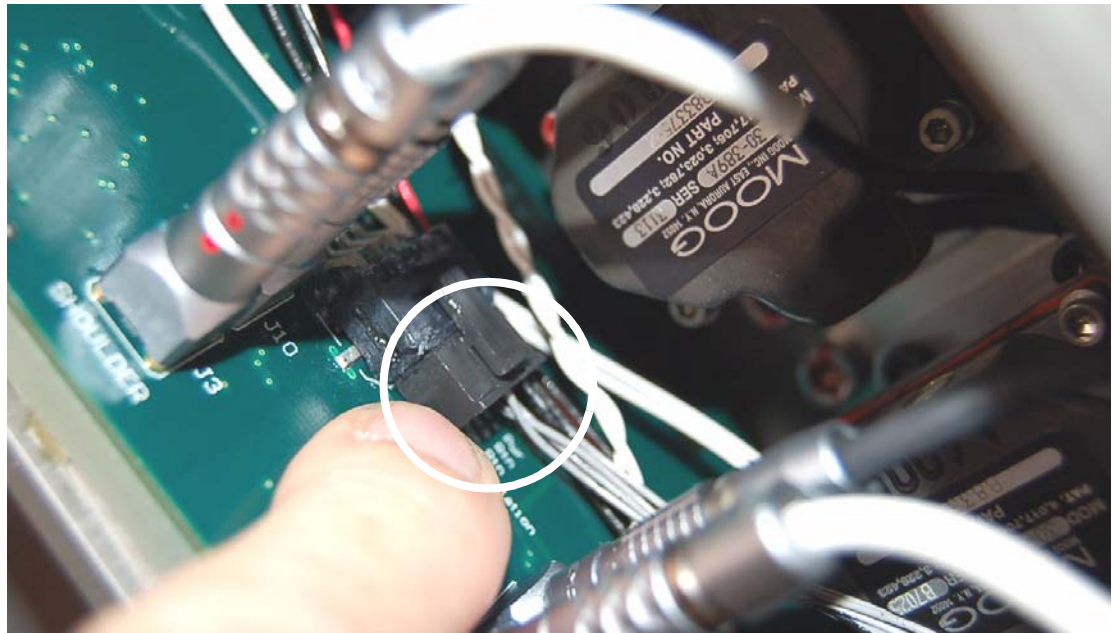
- i. In the forearm, slide the piece of white shrink tubing 005-1706 onto one of the coax cables then mate cables 005-4948 and 101-5159 (or existing coax cable from penetrator). Slide the shrink tubing over both connectors and heat-shrink in place. See [Figure 7](#).

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**Figure 7** Cables 005-4948 connection

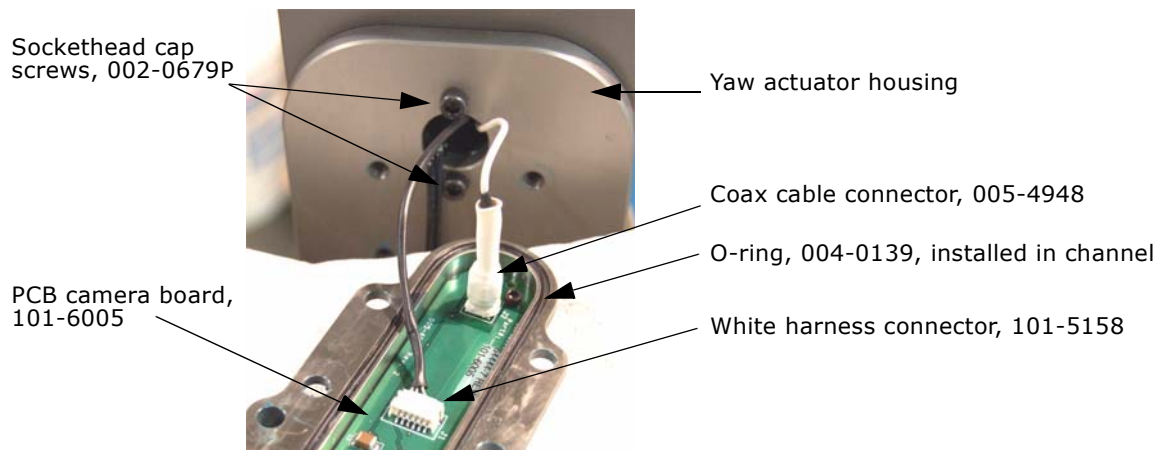
5. Connect the black connector to the auxiliary connector on the PCB, as shown in [Figure 8](#), circled.



**Figure 8** Wrist cable to SCE connection

6. Feed the white connector out of the forearm, and then through the pitch and yaw actuators. The white connector should extend about 7.62 cm (3-in.) out of the top yaw actuator wireway. See [Figure 6 on page 4](#).
7. Apply o-ring lube and install o-ring, 004-0139, to the channel in the mounting face of the camera housing. See [Figure 9](#).
8. Connect the white harness connector and coax cable connector to the connectors in the camera housing as shown in [Figure 9](#).

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**Figure 9** Camera to SCE Harness

9. Before securing the camera to the yaw plate, check that the two sockethead cap screws (Figure 9) are torqued to 7.3 Nm (65 lbf/in).
10. Install the camera to the yaw actuator housing using the four wire cover screws removed in step 1. Lubricate the bolts with AquaShield and torque to 28.5 Nm (21 lbf/ft).
11. Using four new manifold plate screws (002-0333P), secure the manifold to the yaw actuator housing. Lubricate the bolts with AquaShield and torque to 28.5 Nm (21 lbf/ft).

**Note:** Be sure all wires and coax are clear of mating faces before you tighten the bolts.

12. Re-install the remaining wire cover plates. Torque all upper arm cover plate bolts to 10.8 Nm (8 lbf/ft). Torque bolts for the wireway covers, forearm manifold cover, and camera to 28.5 Nm (21 lbf/ft).

## 4 Operating the Camera

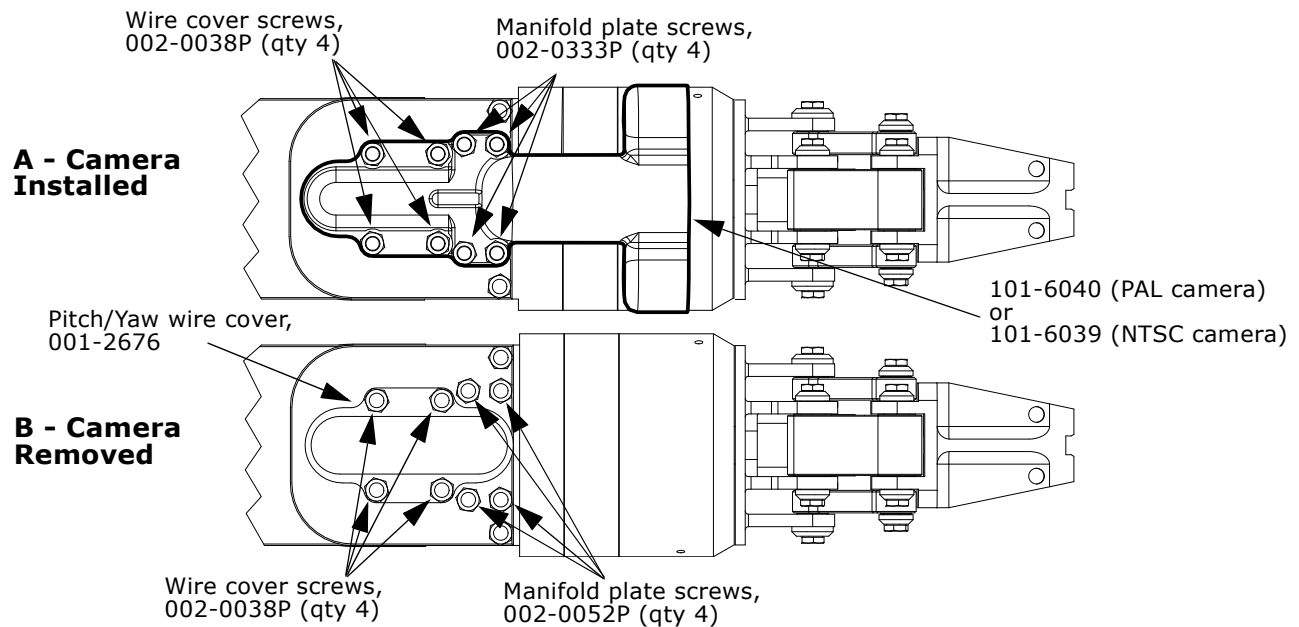
Use the master controller DRIVERS menu to operate the camera and LED camera lights.

1. While the system is in OPERATE mode, press the DRIVERS key.
2. To turn the camera on and off, press #5 until the label reads “ON.”
3. To switch LED lights to full intensity, press #4 until the label reads “ON.”
4. To switch LED lights to half intensity, press #3 until the label reads “ON,” and press #4 until the label reads “OFF.”

If both #3 and #4 are ON, the LED lights will remain at full intensity.

## 5 Removing the Camera

To remove the Titan 4 wrist camera follow the instructions below.



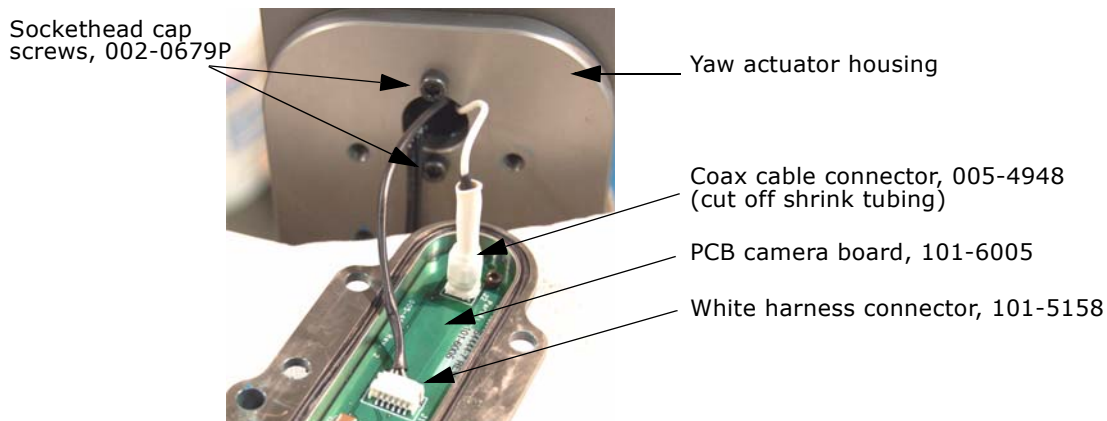
**Figure 10**

1. Remove the four wire cover screws, 002-0038P, from the camera assembly (Figure 10, A) and save for step 6.
2. Remove the four manifold plate screws (Figure 10, A). These screws will **not** be reused.
3. Cut off the shrink tubing from the coax cable connector and disconnect from the PCB camera board. See Figure 11.

**Note:** The coax cable and white harness cable can be tucked into the yaw actuator housing for future camera installation. If doing so, install a piece of heat shrink (005-1706) onto the coax cable connector to prevent a ground fault.

4. Disconnect the white harness cable connector from the PCB camera mount. See Figure 11.

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**Figure 11**

5. Before installing the pitch/yaw wire cover (Figure 10, B):
  - Inspect the O-ring (004-0139) and replace if necessary.
  - Check the two sockethead cap screws, 002-0679P, (Figure 11) and confirm they are torqued to 7.3 Nm (65 lbf/in).
6. Secure the pitch/yaw wire cover with the four wire cover screws removed in step 1. Lubricated the bolts with AquaShield and torque to 28.5 Nm (21 lbf/ft). See Figure 10, B.
7. Re-install four new manifold plate screws (002-0052P) to the yaw actuator (Figure 10, B). Do not use old screws. Lubricated the bolts with AquaShield and torque to 28.5 Nm (21 lbf/ft).
8. The slave arm is ready for normal operation.

Refer to the Titan 4 Technical Manual specific to your system for further information.

## 6 Drawings & Part Lists

The part lists and drawings in this section are in numerical order, ordered first by the three digit prefix, and then by the following four digit number. For a complete list, see the index below.

- Individual parts of a component are cross-referenced between the drawing and part list using the numbers in the “Item” column. On the drawing, item numbers are placed in a circle, with lines drawn to the related part.
- Zero (0) quantity items are for reference only (typically schematics, special assembly tools, or expendable materials used during initial assembly).
- Electrical schematics (prefix 035-) and hydraulic schematics (prefix 025-) do not have part lists.

# Wrist Camera Installation & Operation •

## Index

If a drawing has details that are difficult to read on the printed page, look for it in the “Reference Drawings & Part Lists” volume (which uses a larger paper size), or open the PDF manual file containing the drawing and zoom in on the desired details.

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NOTE: Part list only

## Titan Wrist Camera Kit, NTSC, 101-5074

Rev. A

Item	P/N	Description	Qty
1	101-6039	CAMERA,WRIST,T4,NTSC	1
2	101-5158	CABLE,WRIST CAMERA TO SCE	1
3	101-5159	CABLE,COAX,WRIST,SEANET/CAMERA	1
4	005-4948	CABLE,SMA-M TO SMA-M,36"	1
5	005-1706	TBG,SHRINK,3/8 WHT	0.25
6	002-0333P	NAS 6404PU14,NLK	4
7	004-0139	O-RING,2-040 BUNA 70	1
50	011-9645	MNL,T4 CAMERA/LED LITES KIT	1

NOTE: Part list only.

## Titan Wrist Camera Kit, PAL, 101-5074-1

Rev. B

Item	P/N	Description	Qty
1	101-6040	CAMERA,WRIST,T4,PAL	1
2	101-5158	CABLE,WRIST CAMERA TO SCE	1
3	101-5159	CABLE,COAX,WRIST,SEANET/CAMERA	1
4	005-4948	CABLE,SMA-M TO SMA-M,36"	1
5	005-1706	TBG,SHRINK,3/8 WHT	0.25
6	002-0333P	NAS 6404PU14,NLK	4
7	004-0139	O-RING,2-040 BUNA 70	1
50	011-9645	MNL,T4 CAMERA/LED LITES KIT	1

## Cable, Wrist Camera to SCE, 101-5158

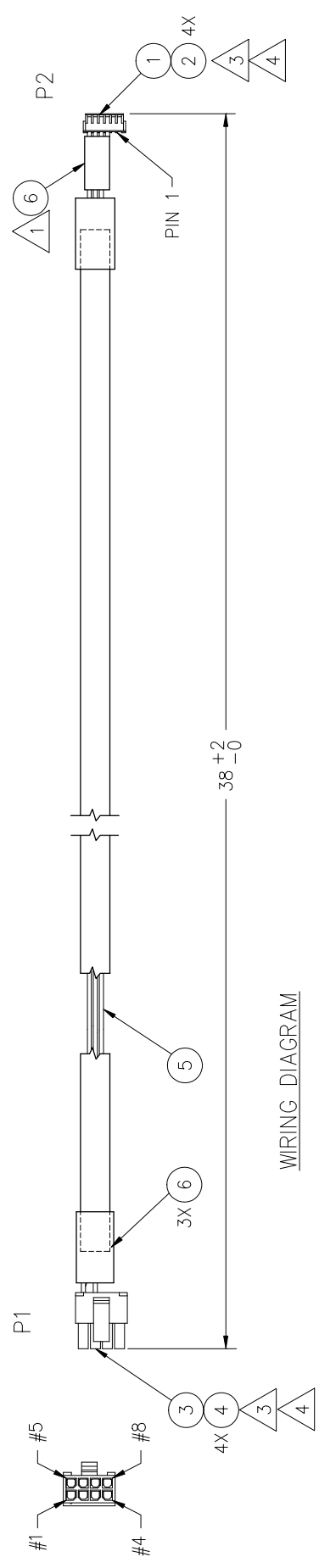
Rev. E

Item	P/N	Description	Qty
1	005-4932	CONN,6 PIN,HOUSING,ZH,1.5MM	1
2	005-4933	TERMINAL,CRIMP,FEMALE,26 AWG	4
3	005-4743	CONN,8 PIN,RCPT,3mm,LATCH	1
4	005-4627	TERM,CRIMP,FEMALE,20-24AWG,3mm	4
5	005-3610	WIRE,26AWG,STRD,600V,GRAY W/BL	13
6	005-1216	TBG,SHRINK,3/32(BRIM # SH135-3	3.5
1000	101-5158-WI	WORK ISNTRUCTIONS	0

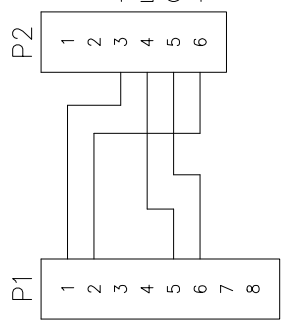
2

**NOTES:**

- 1 PLACE A .75" PIECE OF HEAT SHRINK TUBING (ITEM 6) TO WITHIN 1/10" OF ITEM 1 AND SHRINK WITH A HEAT GUN.
- 2 ASSEMBLE CABLE PER IPC-A-620 CLASS II REQUIREMENTS.
- 3 CRIMP CONNECTOR TERMINALS ITEMS (2) AND (4) TO THE WIRES AS OUTLINED IN THE WIRING DIAGRAM. CRIMP QUALITY FOR ALL TERMINALS SHALL MEET IPC-A-620 (CURRENT REVISION) REQUIREMENTS.
- 4 AFTER THE CONNECTOR TERMINALS ITEMS (2) AND (4) ARE CRIMPED, SOLDER THE CRIMPED TERMINALS TO THE WIRE. THE SOLDER QUALITY OF THE TERMINALS SHOULD MEET IPC-A-620 (CURRENT REVISION) CLASS II REQUIREMENTS. ALL WIRES MUST BE DISCERNIBLE IN THE SOLDER AND ALL RESIDUES INCLUDING FLUX MUST BE REMOVED.



WIRING DIAGRAM



REV	ZONE	DESCRIPTION	DATE	BY	APPR
0	-	RELEASED FOR PROTOTYPE	2/1/06	PK	ATS
1	-	"P1" PINS 4 & 5 WERE PINS 1 & 8 REV INTERVAL DIMENSIONS	4/17/06	GD	WK
2	-	ADDED NOTE 1, LABELS TO WIRING DIAGRAM	6/14/06	PK	WK
3	-	NOTE 1 REVISED: .75" PIECE WAS 1"	7/5/06	RVG	WK
4	-	REORIENTED ITEM 3	3/5/07	JG	WK
A	-	RELEASED FOR PRODUCTION	5/16/07	RDJ	SLW
B	-	ADD LONGER HEAT SHRINK AND NOTE	7/2/07	VDM	SLW
C	-	ADD DELTA AND NOTES 2, 3, 4 TO DWG	2/27/09	VDM	ZS

<b>SCHILLING</b> ROBOTICS		PROJECT T4	
NEXT ASSEMBLY		TITLE	
101-5074	101-5074-1	DATE	2/1/06
GENERAL NOTES		DRAWN	PK
INTERPRET DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994. IN ADDITION, (S) DENOTES REGARDLESS		DESIGNED	ATS
REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.		CHECKED	
ALL MACHINED SURFACES TO BE 6.3 RMS FINISH UNLESS OTHERWISE NOTED. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.		LEAD	ATS
TOLERANCES		ANGLES	
DECIMALS	FRACTIONS	X	+30'
.XX ±.02	.X ±.1	.XX	.XX ±15'
.XXX ±.005	.X ±.1		
RELEASED FOR PRODUCTION		CABLE, WRIST CAMERA TO SCE	
SCALE: 1=1		DRAWING NUMBER	101-5158
SCALE: 1=1		SIZE	B 1 of 1
SCALE: 1=1		SHEET	1 of 1
SCALE: 1=1		REV	C

## Titan Wrist Camera, NTSC, 101-6039

Rev. C

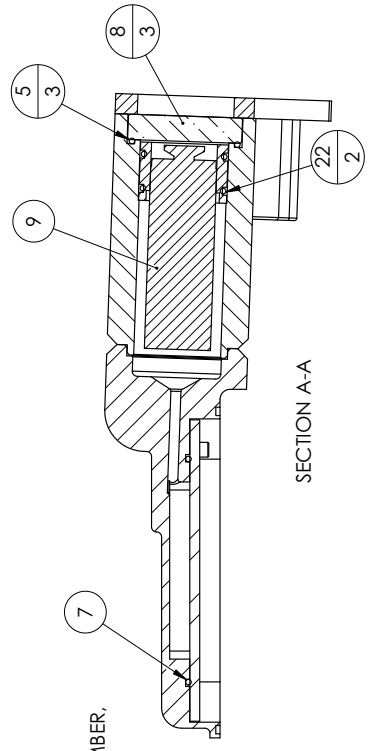
Item	P/N	Description	Qty
1	007-0675	HOUSING,CAMERA,WIRST,T4	1
2	001-7684	BEZEL,WRIST CAMERA,T4	1
4	002-1112P	NAS 6403PU1,NLK	4
5	004-0832	O-RING,2-026,BUNA 70	3
7	004-0043	O-RING,2-033 BUNA 70	1
8	001-9110	WINDOW,36mmX8mm,SAPHIRE	3
9	005-5375	CAMERA,COLOR BULLET NTSC	1
10	101-6006	ASSY,PCB WRIST CAM LED BOARD	2
11	005-5411	EPOXY,OPT CLEAR HIGH IMPACT	1
12	101-6005	ASSY,PCB CAMERA BOARD	1
20	005-0654	TBG,SHRINK,3/64,BLK,BRIM # SH1	0.13
21	002-3256	SHCS,4-48 X 1/4, ALLOY	2
22	004-0695	O-RING,2-021,BUNA 70	2
24	005-3087	WIRE,26AWG,STRD,TEFZEL,600,RED	2.3
25	005-2154	WIRE,26AWG,19/38 TEFZEL 600V	2.3
26	002-3292	FOAM STRIP,3/8 THICK	0.3
27	001-7886	DIFFUSER,CAMERA LIGHT	2
28	005-3092	WIRE,26AWG,STRD,TEFZEL,600,YEL	0.8
30	005-5980	DESICCANT,MOIST ABSORB BOARD	0
1000	101-6039-WI	WORK INSTRUCTIONS	0

2

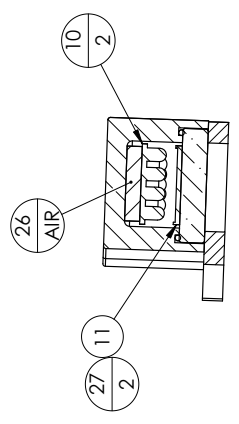
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**NOTES:**

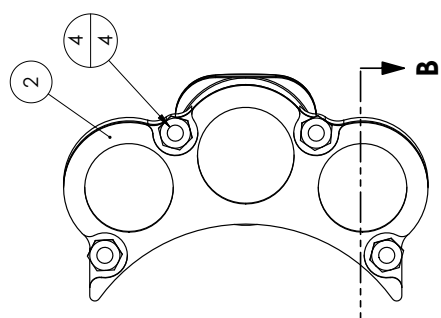
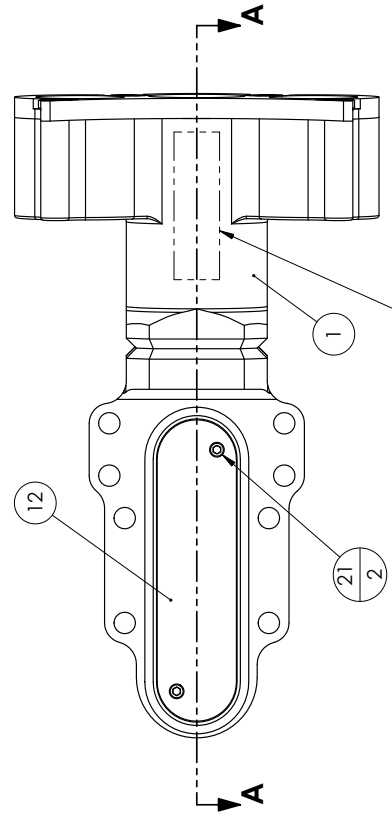
- 1. ITEMS LISTED BELOW TO BE TORQUED AS INDICATED:  
 ITEMS: TORQUE:  
 4 10 FOOT LBS.  
 21 8 INCH LBS.
- 2. ETCH OR ENGRAVE THE SERIAL NUMBER, PART NUMBER, AND BOM REVISION IN THE LOCATION SHOWN AS DESCRIBED IN THE WORK INSTRUCTION.



SECTION A-A



SECTION B-B



GENERAL NOTES

INTERPRET DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994. IN ADDITION, (1) DENOTES REGARDLESS OF FEATURE SIZE.

REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.

ALL MACHINED SURFACES TO BE .63 RMS FINISH UNLESS OTHERWISE NOTED.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

TOLERANCES	
DECIMALS	ANGLES
XX ±.02	X ±30
XXX ±.005	.XX ±15
±1/16	

NEXT ASSEMBLY

SIGNATURE	DATE
DRAWN: CRL	3/2/07
DESIGNED: CA	3/2/07
CHECKED:	
LEAD: SLW	

SCHILLING ROBOTICS		PROJECT: T4
TITLE: CAMERA, WRIST, T4, NTSC		SCALE: 1:1.5
DRAWING NUMBER: 101-6039	SIZE: B	SHEET: 1 OF 2
REV: A	REV: SLW	REV: SLW

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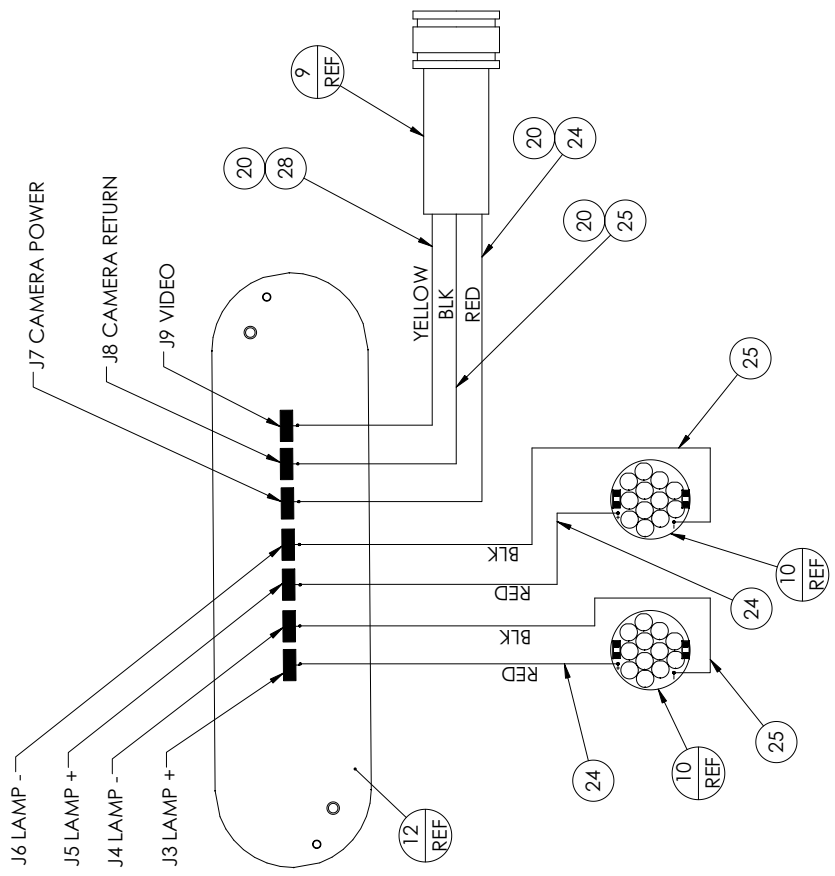
RELEASED FOR PRODUCTION

2

1

2 1

WIRING DIAGRAM



**SCHILLING**  
ROBOTICS

PROJECT T4

TITLE CAMERA, WRIST,  
T4, NTSC

SCALE: 1:1.5

DRAWING NUMBER 101-6039

SIZE B

SHEET 2 of 2

REV A

RELEASED FOR  
PRODUCTION

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# Titan Wrist Camera, PAL, 101-6040

Rev. B

Item	P/N	Description	Qty
1	007-0675	HOUSING,CAMERA,WIRST,T4	1
2	001-7684	BEZEL,WRIST CAMERA,T4	1
4	002-1112P	NAS 6403PU1,NLK	4
5	004-0832	O-RING,2-026,BUNA 70	3
7	004-0043	O-RING,2-033 BUNA 70	1
8	001-9110	WINDOW,36mmX8mm,SAPHIRE	3
9	005-5376	CAMERA,COLOR BULLET PAL	1
10	101-6006	ASSY,PCB WRIST CAM LED BOARD	2
11	005-5411	EPOXY,OPT CLEAR HIGH IMPACT	1
12	101-6005	ASSY,PCB CAMERA BOARD	1
20	005-0654	TBG,SHRINK,3/64,BLK,BRIM # SH1	0.13
21	002-3256	SHCS,4-48 X 1/4, ALLOY	2
22	004-0695	O-RING,2-021,BUNA 70	2
24	005-3087	WIRE,26AWG,STRD,TEFZEL,600,RED	2.3
25	005-2154	WIRE,26AWG,19/38 TEFZEL 600V	1.5
26	002-3292	FOAM STRIP,3/8 THICK	0.3
27	001-7886	DIFFUSER,CAMERA LIGHT	2
28	005-3088	WIRE,26AWG,STRD,TEFZEL,600,BLU	0.8
29	005-3089	WIRE,26AWG,STRD,TEFZEL,600,GRN	0.8
30	005-5980	DESICCANT,MOIST ABSORB BOARD	0
1000	101-6040-WI	WORK INSTRUCTIONS	0

2

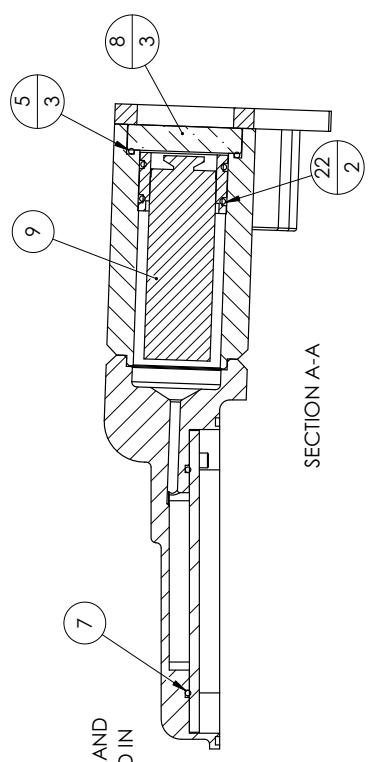
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**NOTES:**

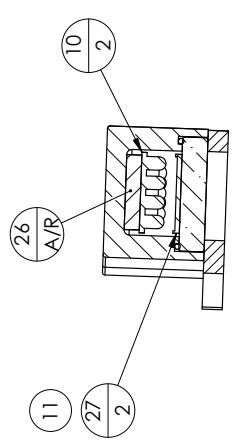
- 1. ITEMS LISTED BELOW TO BE TORQUED AS INDICATED:  
 ITEMS: \_\_\_\_\_ TORQUE: \_\_\_\_\_

- 4 \_\_\_\_\_ 10 FOOT LBS.
- 21 \_\_\_\_\_ 8 INCH LBS.

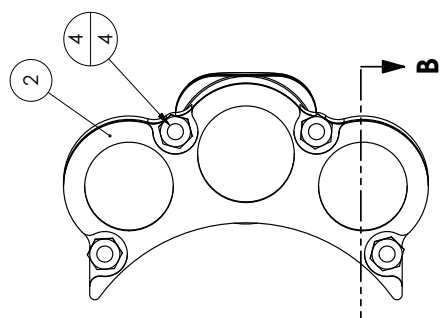
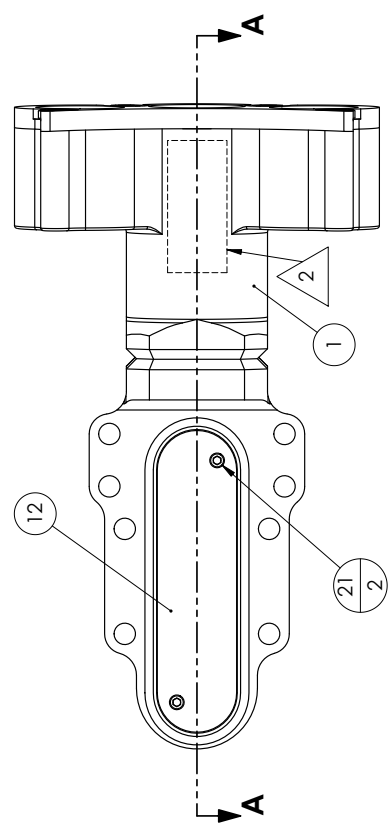
- 2  ETCH OR ENGRAVE SERIAL NUMBER, PART NUMBER AND BOM REVISION IN LOCATION SHOWN AS DESCRIBED IN WORK INSTRUCTIONS.



SECTION A-A



SECTION B-B



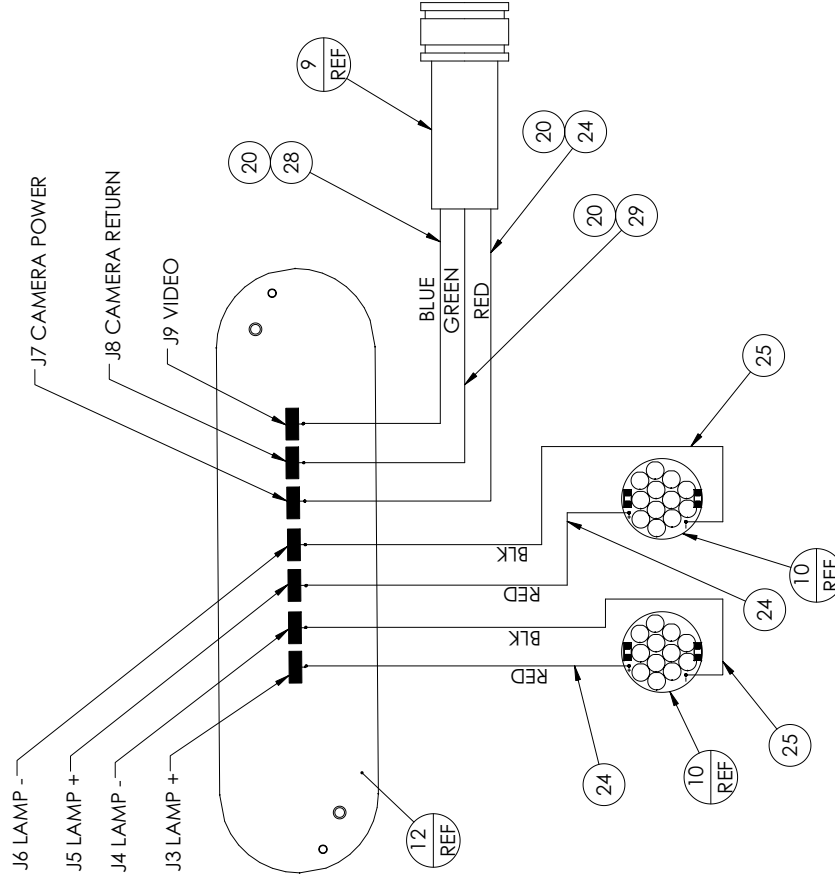
<p><b>PROPRIETARY</b></p> <p>THIS DOCUMENT CONTAINS INFORMATION PROPRIETARY TO SCHILLING ROBOTICS. ANY REPRODUCTION, DISCLOSURE OR DISTRIBUTION OF THIS DOCUMENT WITHOUT THE WRITTEN AGREEMENT OF SCHILLING ROBOTICS MAY OTHERWISE AGREE TO UNWRITING.</p>		<p><b>RELEASED FOR PRODUCTION</b></p>		<p>GENERAL NOTES</p> <p>INTERPRET DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2018. IN ADDITION, (1) DENOTES REGARDLESS OF FEATURE SIZE.</p> <p>REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.</p> <p>ALL MACHINED SURFACES TO BE 63 RMS FINISH UNLESS OTHERWISE NOTED. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.</p>		<p>NEXT ASSEMBLY</p>		<p><b>SCHILLING ROBOTICS</b></p>	
<p>DENOMIALS</p> <p>XX ±.02</p> <p>XXX ±.005</p>		<p>FRACTIONS</p> <p>1/16</p>		<p>ANGLES</p> <p>X #30</p> <p>.XX #15</p>		<p>DATE</p> <p>3/2/07</p>		<p>PROJECT</p> <p>T4</p>	
<p>DESIGNED</p> <p>CA</p>		<p>CHECKED</p> <p>SLW</p>		<p>DRAWN</p> <p>CRL</p>		<p>DATE</p> <p>3/2/07</p>		<p>TITLE</p> <p>CAMERA, WRIST, T4, PAL</p>	
<p>SCALE</p> <p>1:1.5</p>		<p>DRAWING NUMBER</p> <p>101-6040</p>		<p>SIZE</p> <p>B</p>		<p>SHEET</p> <p>1</p>		<p>REV</p> <p>A</p>	

2

1

2 1

WIRING DIAGRAM



**SCHILLING**  
ROBOTICS

PROJECT: T4  
TITLE: CAMERA, WRIST, T4, PAL

SCALE: 1:1.5  
DRAWING NUMBER: 101-6040  
SIZE: B  
SHEET: 2 of 2  
REV: A

RELEASED FOR PRODUCTION

2 1

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## 1/3" CCD Color Bullet camera(Weatherproof)

### - High Resolution -

### Key Features

**\* Crisp clear Color reproduction**

The unit enjoys the quality advantages derived from 1/3" CCD sensor which shows better resolution and sensitivity than smaller CCD's. It is further supported with our own noise-free power circuit and company's know-hows in integrating all necessary technical features into the small bullet housing. The unit is fully equipped with all functions that make the camera perform a perfect operation with true color excellent sensitivity and long lasting reliability. It boasts of its supreme performance of producing true natural coloration which is close to that of the human eye.

**\* Lens**

The smart idea with user friendly housing mechanism make it possible to adapt a wide range of different focal lens. Installers can change the lens easily without changing the camera in order to fix the exact angel of view and suitable focal distance.

**\* Condensation free**

Our weatherproof versions provide a perfect solution for moisture leakage problem against any harsh weather conditions. The camera is assembled in a clear vacuum status and further protected to stop moisture or water smearing into the camera even under continual weather changes.

**\* Super low light sensitivity**

Used with super sensitive 1/3" CCD sensor, it is brighter than ever in dark illumination. 0.3Lux at F2.0 Additional noise-free picture quality at dark view add its low lux performance to maximum.

**\* Compact Size**

Incorporating all innovative features, those are used with 1/3" CCD format and made with the world's smallest size.

**\* Beautiful design**

Our fine craftsmanship reaches not only to the picture quality and compact size but also to the products GD(Good Design). Everything we manufacture has their own unique face and shape. Aiming to best fit any environment.

**\* Easy Installation**

A universal mounting structure plus our user friendly designed camera provide a useful way of installation to various settings such as on the ceiling, wall, shelf or on a corner providing adjustable 360 Degree of viewing angle without permitting any invisible position.

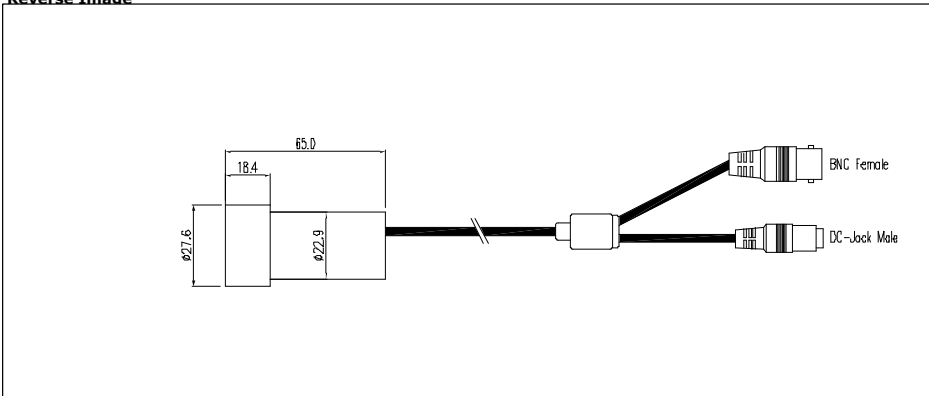
**\* IR Sensitivity (Option)**

Color CCD sensor is responsive to IR illumination at night and reproduces true coloration in the daytime.

**\* Reverse Polarity protection built in**

### Optional Features

**Reverse Image**



### Specification

<b>Model</b>	<b>WDB-5457SR-NTSC</b>
<b>Image Sensor</b>	1/3" Hi. Resolution Color Super HAD Sharp CCD
<b>Effective Pixels</b>	NTSC: 752(h) x 582(v) PAL: 768(h) x 494(v)
<b>H. Resolution</b>	480 TV Lines
<b>Sync. System</b>	Internal NTSC 525 Lines; PAL 625 Lines 2:1 Interlaced
<b>Video Output</b>	1.0Vp-p Composite, 75Ohms
<b>S/N Ratio</b>	More than 50dB (AGC Off)
<b>Min. Illumination</b>	0.3Lux at F2.0
<b>BLC</b>	Automatic
<b>Gain Control</b>	4dB~30dB Auto
<b>Gamma</b>	r=0.45
<b>Smear Effect</b>	0.005%
<b>Shutter Speed</b>	NTSC: 1/60~1/100,000 sec PAL: 1/30~1/100,000 sec
<b>MTBF</b>	80,000 hrs DC12V(+/-10%)
<b>Power</b>	90mA w/ regulated 12VDC in
<b>Lens</b>	3.6mm - others available
<b>Operating Temp.</b>	14 Deg F ~ 122 Deg F (-10 Deg C ~ +50 Deg C) Within 90% RH
<b>Dimensions</b>	1.5N DIY Cables w/ BNC-Female for video DC Jack-Male for power 27.6(D) x 65(L)

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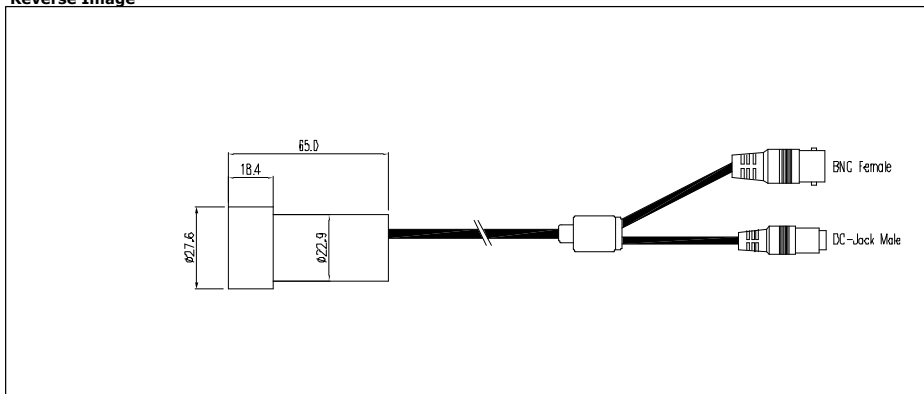
#### \* IR Sensitivity (Option)

Color CCD sensor is responsive to IR illumination at night and reproduces true coloration in the daytime.

#### \* Reverse Polarity protection built in

### Optional Features

#### Reverse Image



**WDB-5457SR-PAL**  
Weatherproof  
Lens Exchangeable  
0.3Lux/F2.0

### Specification

<b>Model</b>	<b>WDB-5457SR-PAL</b>
<b>Image Sensor</b>	1/3" Hi. Resolution Color Super HAD Sharp CCD
<b>Effective Pixels</b>	NTSC: 752(h) x 582(v) PAL: 768(h) x 494(v)
<b>H. Resolution</b>	480 TV Lines
<b>Sync. System</b>	Internal NTSC 525 Lines; PAL 625 Lines 2:1 Interlaced
<b>Video Output</b>	1.0Vp-p Composite, 75Ohms
<b>S/N Ratio</b>	More than 50dB (AGC Off)
<b>Min. Illumination</b>	0.3Lux at F2.0
<b>BLC</b>	Automatic
<b>Gain Control</b>	4dB~30dB Auto
<b>Gamma</b>	r=0.45
<b>Smear Effect</b>	0.005%
<b>Shutter Speed</b>	NTSC: 1/60~1/100,000 sec PAL: 1/30~1/100,000 sec
<b>MTBF</b>	80,000 hrs DC12V(+/-10%)
<b>Power</b>	90mA w/ regulated 12VDC in
<b>Lens</b>	3.6mm - others available
<b>Operating Temp.</b>	14 Deg F ~ 122 Deg F (-10 Deg C ~ +50 Deg C) Within 90% RH 1.5N DIY Cables w/ BNC-Female for video DC Jack-Male for power
<b>Dimensions</b>	27.6(D) x 65(L)

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