

# Gold Solo Twitter Digital Servo Drive Installation Guide



## Notice

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- Information in this document is subject to change without notice.

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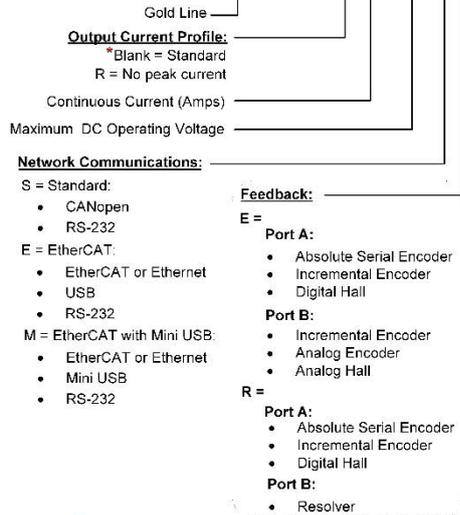
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# Catalog Number

**G-SOLTWIRXX/YYYEE1SQ**



**Dual Use:**

Q — Not subjected to export control according to ECCN-3A225 (US) or 428/2009 - 3A225 (EU Dual Use) Commutation frequency limited to 599Hz

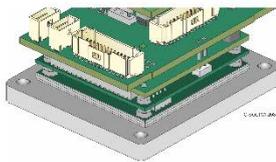
Blank - Standard. No Commutation frequency limitation

**Power Supply & Heatsink Options:**

S = Control Supply (VL) 11V – 95V

\*Blank =VL <40V

H = Control Supply (VL) 11V – 95V with Flat Heatsink

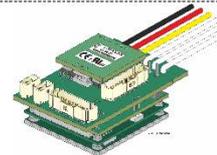


\* Note: Blank refers to the default option. It is not shown as a space.

**Options:**

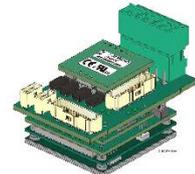
**Wires power connection**

- 1 = 24 V I/O & STO – High side logic (Source)
- 2 = 5 V I/O & STO – High side logic (Source)
- 3 = 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



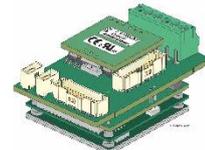
**Pluggable vertically positioned power connector for drives rated current XX ≤ 10A**

- 4 = 24 V I/O & STO – High side logic (Source)
- 5 = 5 V I/O & STO – High side logic (Source)
- 6 = 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



**Horizontally positioned power connector for drives rated current XX ≤ 25A**

- 7 = 24 V I/O & STO – High side logic (Source)
- 8 = 5 V I/O & STO – High side logic (Source)
- 9 = 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



To order the accessories refer to the Chapter 11: Accessories.

## Revision History

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## Chapter 1: This Installation Guide

This installation Guide details the technical data, pinouts, and power connectivity of the Gold Solo Twitter. For a comprehensive detailed description of the functions and connections of the drive, refer to the Gold Board Level Module Hardware Manual.

## Chapter 2: Safety Information

In order to achieve the optimum, safe operation of the Gold Solo Twitter, it is imperative that you implement the safety procedures included in this installation guide. This information is provided to protect you and to keep your work area safe when operating the Gold Solo Twitter and accompanying equipment.

**Please read this chapter carefully before you begin the installation process.**

Before you start, ensure that all system components are connected to earth ground. Electrical safety is provided through a low-resistance earth connection.

Only qualified personnel may install, adjust, maintain and repair the servo drive. A qualified person has the knowledge and authorization to perform tasks such as transporting, assembling, installing, commissioning and operating motors.

The Gold Solo Twitter contains electrostatic-sensitive components that can be damaged if handled incorrectly. To prevent any electrostatic damage, avoid contact with highly insulating materials, such as plastic film and synthetic fabrics. Place the product on a conductive surface and ground yourself in order to discharge any possible static electricity build-up.

To avoid any potential hazards that may cause severe personal injury or damage to the product during operation, keep all covers and cabinet doors shut.

The following safety symbols are used in this and all Elmo Motion Control manuals:



**Warning:**

This information is needed to avoid a safety hazard, which might cause bodily injury or death as a result of incorrect operation.



**Hot Surface Warning:**

To alert against surfaces that may reach high temperatures. The heatsink and wires may reach high temperatures.



**Caution:**

This information is necessary to prevent bodily injury, damage to the product or to other equipment.



**Important:**

Identifies information that is critical for successful application and understanding of the product.



## 2.1. Warnings

- To avoid electric arcing and hazards to personnel and electrical contacts, never connect/disconnect the servo drive while the power source is on.
- Power cables can carry a high voltage, even when the motor is not in motion. Disconnect the Gold Solo Twitter from all voltage sources before servicing.
- The high voltage products within the Gold Line range contain grounding conduits for electric current protection. Any disruption to these conduits may cause the instrument to become hot (live) and dangerous.
- After shutting off the power and removing the power source from your equipment, wait at least 1 minute before touching or disconnecting parts of the equipment that are normally loaded with electrical charges (such as capacitors or contacts). Measuring the electrical contact points with a meter, before touching the equipment, is recommended.

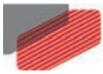


## 2.2. Cautions

- The maximum DC power supply connected to the instrument must comply with the parameters outlined in this guide.
- When connecting the Gold Solo Twitter to an approved control supply, connect it through a line that is separated from hazardous live voltages using reinforced or double insulation in accordance with approved safety standards.
- Before switching on the Gold Solo Twitter, verify that all safety precautions have been observed and that the installation procedures in this manual have been followed.
- Make sure that the Safe Torque Off is operational.

## 2.3. Warranty Information

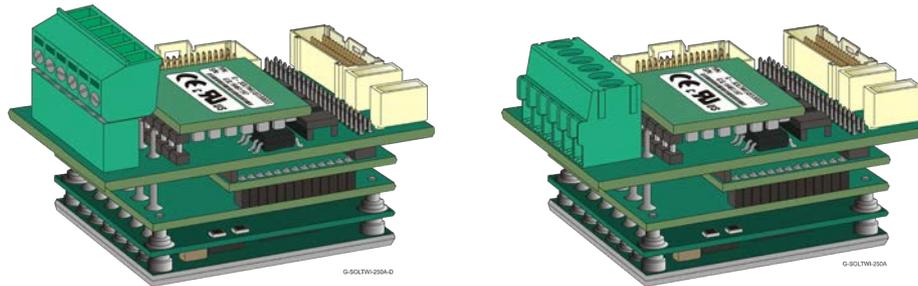
The products covered in this manual are warranted to be free of defects in material and workmanship and conform to the specifications stated either within this document or in the product catalog description. All Elmo drives are warranted for a period of 12 months from the date of shipment. No other warranties, expressed or implied — and including a warranty of merchantability and fitness for a particular purpose — extend beyond this warranty.



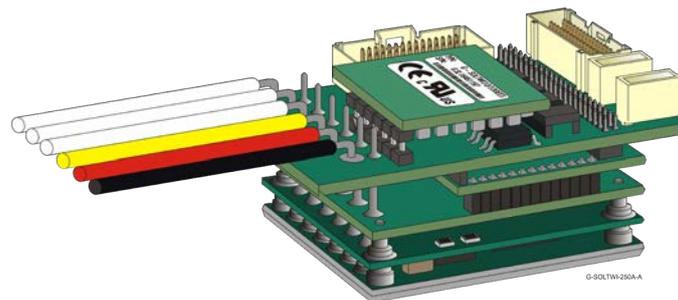
## Chapter 3: Product Description

The Gold Solo Twitter is a “ready to use Gold Twitter”, advanced high power density, highly intelligent servo drive operational within a few minutes, delivering up to **5.6 kW power** in an average 30.59 cm<sup>3</sup> (1.87 in<sup>3</sup>) compact package (refer to Chapter 10: Dimensions, Physical Specifications for details). A cable kit and optional heat sinks are available for easy and fast operation of the Gold Solo Twitter.

The Gold Solo Twitter which is provided in the optional forms shown in Figure 1, provides top performance, advanced networking and built-in certified safety, as well as a fully featured motion controller and local intelligence.



**Vertical ( $\leq 10A$ ) or Horizontal ( $\leq 25A$ ) Power Connector for Output Current**



**Wired Power Connection (recommended for  $>25A$  Output Current, but optional for  $\leq 25A$ )**

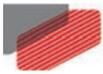
**Figure 1: Gold Solo Twitter with Power Connectors Options**

Power to the Gold Solo Twitter is provided by a DC power source which is isolated from the Mains. The Gold Solo Twitter can operate with single or dual power supplies. If separation between the main DC power source and a control supply is required, then a control supply (also isolated from the Mains) is required.

The drive can operate as a stand-alone device or as part of a multi-axis system in a distributed configuration on a real-time network.

The Gold Solo Twitter drive is easily set up and tuned using the Elmo Application Studio (EASII) software tools. As part of the Gold product line, it is fully programmable with the Elmo motion control languages. For more information about software tools refer to the Elmo Application Studio (EASII) User Guide.

Optionally, where necessary, Elmo offers two external heat sinks (Catalog number: G-TWIHSFINS01, and G-TWIHSFLAT01) which should be ordered separately. Refer to the section 6.2 Mounting the Optional Accessories Heat Sinks for details of installing the heatsinks.



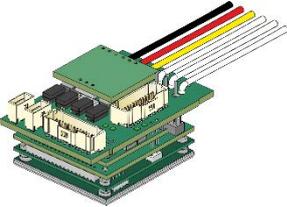
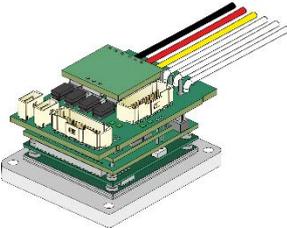
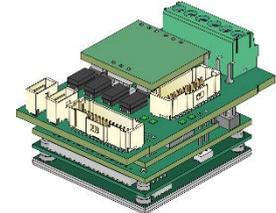
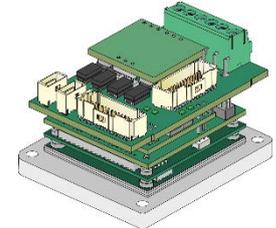
## Chapter 4: Technical Information

**Note:**

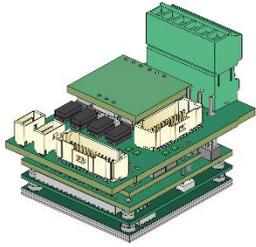
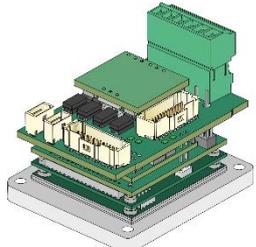
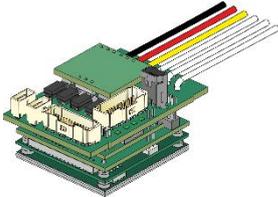
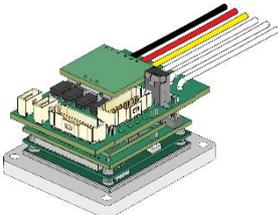
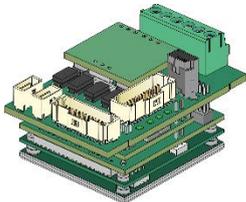
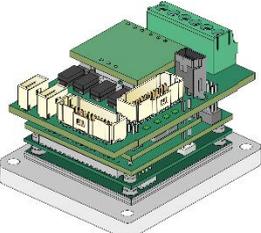
It should be noted that for all models, the Max Output current is guaranteed for  $T_{\text{Heat-Sink}} < 85^{\circ}\text{C}$

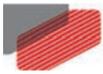
### 4.1. Physical Specifications

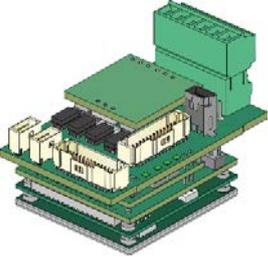
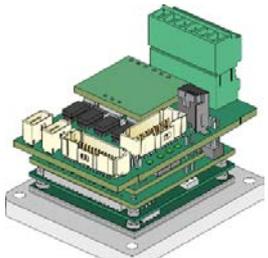
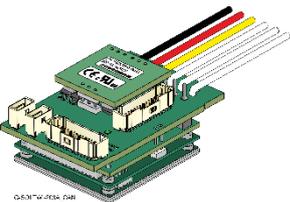
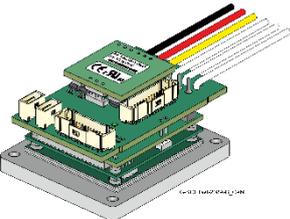
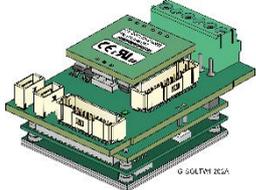
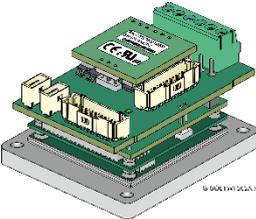
Throughout the feature column, for each product, there is a blue hyperlink to the relevant section in the Dimensions chapter.

Product	Catalog Number	Description
<b>EtherCAT with USB Molex Connector</b>		
	<a href="#">G-SOLTWIRXX/YYEE1SQ</a>	<p>Gold Solo Twitter with wired power connections:</p> <ul style="list-style-type: none"> <li>• E = EtherCAT with USB Molex Connector</li> <li>• E = Feedback options</li> <li>• 1 = Power connector option, for Wires power connection select 1, 2, or 3</li> <li>• S = control supply VL 11V – 95V without Heatsink</li> <li>• (Blank) = control supply VL&lt;40V without Heatsink</li> <li>• H = control supply with flat Heatsink</li> </ul>
	<a href="#">G-SOLTWIRXX/YYEE1HQ</a>	<p>Gold Solo Twitter with the Phoenix horizontal power connector:</p> <ul style="list-style-type: none"> <li>• E = EtherCAT with USB Molex Connector</li> <li>• E = Feedback options</li> <li>• 1 = Power connector option, for Horizontal power connector select 7, 8, or 9</li> <li>• S = control supply VL 11V – 95V without Heatsink</li> <li>• (Blank) = control supply VL&lt;40V without Heatsink</li> <li>• H = control supply with flat Heatsink</li> </ul>
	<a href="#">G-SOLTWIRXX/YYEE1SQ</a>	<p>Gold Solo Twitter with the Phoenix horizontal power connector:</p> <ul style="list-style-type: none"> <li>• E = EtherCAT with USB Molex Connector</li> <li>• E = Feedback options</li> <li>• 1 = Power connector option, for Horizontal power connector select 7, 8, or 9</li> <li>• S = control supply VL 11V – 95V without Heatsink</li> <li>• (Blank) = control supply VL&lt;40V without Heatsink</li> <li>• H = control supply with flat Heatsink</li> </ul>
	<a href="#">G-SOLTWIRXX/YYEE1HQ</a>	<p>Gold Solo Twitter with the Phoenix horizontal power connector:</p> <ul style="list-style-type: none"> <li>• E = EtherCAT with USB Molex Connector</li> <li>• E = Feedback options</li> <li>• 1 = Power connector option, for Horizontal power connector select 7, 8, or 9</li> <li>• S = control supply VL 11V – 95V without Heatsink</li> <li>• (Blank) = control supply VL&lt;40V without Heatsink</li> <li>• H = control supply with flat Heatsink</li> </ul>

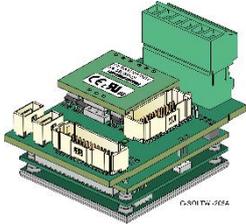
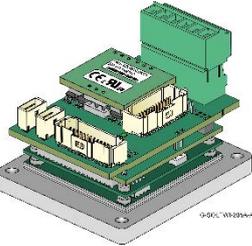


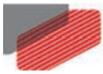
Product	Catalog Number	Description
	G-SOLTWIRXX/YYEE1SQ	<p>Gold Solo Twitter with the Phoenix pluggable vertical power connector:</p> <ul style="list-style-type: none"> <li>E = EtherCAT with USB Molex Connector</li> <li>E = Feedback options</li> <li>1 = Power connector option, for Vertical power connector select 4, 5, or 6</li> <li>S = control supply VL 11V – 95V without Heatsink</li> <li>(Blank) = control supply VL&lt;40V without Heatsink</li> <li>H = control supply with flat Heatsink</li> </ul>
	G-SOLTWIRXX/YYEE1HQ	
<b>EtherCAT with Mini USB</b>		
	G-SOLTWIRXX/YYME1SQ	<p>Gold Solo Twitter with wired power connections:</p> <ul style="list-style-type: none"> <li>M = EtherCAT with Mini USB</li> <li>E = Feedback options</li> <li>1 = Power connector option, for Wires power connection select 1, 2, or 3</li> <li>S = control supply VL 11V – 95V without Heatsink</li> <li>(Blank) = control supply VL&lt;40V without Heatsink</li> <li>H = control supply with flat Heatsink</li> </ul>
	G-SOLTWIRXX/YYME1HQ	
	G-SOLTWIRXX/YYME1SQ	<p>Gold Solo Twitter with the Phoenix horizontal power connector:</p> <ul style="list-style-type: none"> <li>M = EtherCAT with Mini USB</li> <li>E = Feedback options</li> <li>1 = Power connector option, for Horizontal power connector select 7, 8, or 9</li> <li>S = control supply VL 11V – 95V without Heatsink</li> <li>(Blank) = control supply VL&lt;40V without Heatsink</li> </ul>
	G-SOLTWIRXX/YYME1HQ	



Product	Catalog Number	Description
		<ul style="list-style-type: none"> <li>H = control supply with flat Heatsink</li> </ul>
	G-SOLTWIRXX/YYME1SQ	<p>Gold Solo Twitter with the Phoenix pluggable vertical power connector:</p> <ul style="list-style-type: none"> <li>M = EtherCAT with Mini USB</li> <li>E = Feedback options</li> <li>1 = Power connector option, for Vertical power connector select 4, 5, or 6</li> </ul>
	G-SOLTWIRXX/YYME1HQ	
<b>CAN</b>		
	G-SOLTWIRXX/YYSE1SQ	<p>Gold Solo Twitter with wired power connections:</p> <ul style="list-style-type: none"> <li>S = Standard CANopen</li> <li>E = Feedback options</li> <li>1 = Power connector option, for Wires power connection select 1, 2, or 3</li> </ul>
	G-SOLTWIRXX/YYSE1HQ	
	G-SOLTWIRXX/YYSE1SQ	<p>Gold Solo Twitter with the Phoenix horizontal power connector:</p> <ul style="list-style-type: none"> <li>S = Standard CANopen</li> <li>E = Feedback options</li> <li>1 = Power connector option, for Horizontal power connector select 7, 8, or 9</li> </ul>
	G-SOLTWIRXX/YYSE1HQ	



Product	Catalog Number	Description
	G-SOLTWIRXX/YYSE1SQ	<ul style="list-style-type: none"><li>• H = control supply with flat Heatsink</li></ul>
	G-SOLTWIRXX/YYSE1HQ	<ul style="list-style-type: none"><li>• Gold Solo Twitter with the Phoenix pluggable vertical power connector:</li><li>• S = Standard CANopen</li><li>• E = Feedback options</li><li>• 1 = Power connector option, for Vertical power connector select 4, 5, or 6</li><li>• S = control supply VL 11V – 95V without Heatsink</li><li>• (Blank) = control supply VL&lt;40V without Heatsink</li><li>• H = control supply with flat Heatsink</li></ul>



## 4.2. 60V and 100V Models Technical Data

Feature	Units	30/60	1/100	3/100	6/100	10/100	15/100	25/100
Minimum supply voltage	VDC	8	10					
Nominal supply voltage	VDC	48	85					
Maximum supply voltage	VDC	55	95					
Maximum continuous power output	W	1370	80	235	470	800	1125	2000
Efficiency at rated power (at nominal conditions)	%	> 99						
Maximum output voltage		Up to 96% of DC bus voltage						
I <sub>c</sub> , Amplitude sinusoidal/DC continuous current	A	30	1	3	6	10	15	25
Sinusoidal continuous RMS current limit (I <sub>c</sub> )	A	21	0.7	2.1	4.2	7.1	10	17.7
Peak current limit	A	2 x I <sub>c</sub>						

Table 1: 60V and 100V Models Technical Data

## 4.3. 200V Models Technical Data

Feature	Units	3/200	6/200	10/200
Minimum supply voltage	VDC	20		
Nominal supply voltage	VDC	170		
Maximum supply voltage	VDC	195		
Maximum continuous power output	W	485	975	1650
Efficiency at rated power (at nominal conditions)	%	> 99		
Maximum output voltage		Up to 96% of DC bus voltage		
I <sub>c</sub> , Amplitude sinusoidal/DC continuous current	A	3	6	10
Sinusoidal continuous RMS current limit (I <sub>c</sub> )	A	2.1	4.2	7.1
Peak current limit	A	2 x I <sub>c</sub>		

Table 2: 200V Models Technical Data



#### 4.4. R Type Technical Data

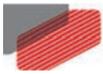
Feature	Units	R50/60	R80/80	R50/100	R70/100	R45/150	R15/200	R35/200
Minimum supply voltage	VDC	8	10	10	10	12	20	20
Nominal supply voltage	VDC	48	65	85	85	115	170	170
Maximum supply voltage	VDC	55	75	95	95	135	195	195
Maximum continuous Electrical power output	kW	2.3	5	4.0	5.6	5	2.5	5.6
Efficiency at rated power (at nominal conditions)	%	> 99						
Maximum output voltage		Up to 96% of DC bus voltage						
Amplitude sinusoidal/DC continuous current	A	50	80	50	70	45	15	35
Sinusoidal continuous RMS current limit (Ic)	A	35.3	56.5	35.3	49.5	32	10.6	24.7

Table 3: R Type Models Technical Data



## 4.5. Control Supply Input Voltage (VL)

Feature	Unit	Details
<b>Standard CAN</b>		
Input range for Power Supply & Heatsink Option: <b>(Blank)</b>	V	12 – 40
Input range for Power Supply & Heatsink Option: <b>S</b> or <b>H</b>	V	12 – 95
24V Control supply input power consumption with encoder up to 200mA@5V	W	<2.5
<b>ETHERCAT (E or M option)</b>		
Input range for Power Supply & Heatsink Option: <b>(Blank)</b>	V	14 – 40
Input range for Power Supply & Heatsink Option: <b>S</b> or <b>H</b>	V	12 – 95
24V Control supply input power consumption with encoder up to 200mA@5V	W	<4



## 4.6. Product Features

Main Feature	Details	Presence / No.
<b>STO</b>	+5V Logic, Opto isolated from the Control section, <i>or</i>	✓
	PLC Source, Opto isolated from the Control section	✓
<b>Digital Input</b>	+5V Logic, Opto isolated from the Control section <i>or</i>	6
	PLC Source, Opto isolated from the Control section <i>or</i>	6
	PLC Sink Opto isolated from the Control section	6
<b>Digital Output</b>	+5V Logic, Opto isolated from the Control section <i>or</i>	4
	PLC Source, Opto isolated from the Control section <i>or</i>	4
	PLC Sink, Opto isolated from the Control section	4
<b>Analog Input</b>	Differential $\pm 10V$ or Single Ended	1
<b>Feedback</b>	Standard Port A, B, & C	✓
<b>Communication Option</b>	USB (only for EtherCAT version)	✓
	EtherCAT <i>or</i>	✓
	CAN	✓
	Standard RS232	✓



## 4.7. Environmental Conditions

You can guarantee the safe operation of the Gold Solo Twitter by ensuring that it is installed in an appropriate environment. The following table describes the certified environmental conditions for STO of the Gold series servo drives.



**Warning:** During operation the Gold Solo Twitter becomes hot to the touch (the heatsink and wires may heat up to 92 °C). Care should be taken when handling it.



**Caution:**

The Gold Solo Twitter dissipates its heat by convection or by conduction. The maximum ambient operating temperature of 50 °C (122°F) must not be exceeded.

Feature	Details
<b>Operating ambient temperature</b>	0 °C to +50 °C (32 °F to +122 °F)
<b>Storage temperature</b>	-40 °C to +85 °C ( -40 °F to +185 °F)
<b>Maximum non-condensing humidity according to IEC60068-2-78</b>	95%
<b>Maximum Operating Altitude</b>	2,000 m (6562 feet) It should be noted that servo drives capable of higher operating altitudes are available on request.
<b>Mechanical Shock according to IEC60068-2-27</b>	15g / 11ms Half Sine
<b>Vibration according to IEC60068-2-6</b>	5 Hz ≤ f ≤ 10 Hz: ±10mm 10 Hz ≤ f ≤ 57 Hz: 4G 57 Hz ≤ f ≤ 500 Hz: 5G



## Chapter 5: Standards and Certifications

### 5.1. Functional Safety

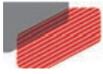
Standard	Item
IEC 61800-5-2:2017	Adjustable speed electrical power drive systems – Safety requirements – Functional
EN ISO 13849-1:2015	Safety of machinery — Safety-related parts of control systems.
EN 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems

### 5.2. Electrical Safety

Specification	Details
Recognized UL 61800-5-1	Adjustable speed electrical power drive systems: Safety requirements – Electrical, thermal and energy
CSA C22.2 NO. 274-17	Adjustable speed drives

### 5.3. Electromagnetic Compatibility

Specification	Details
EN 61800-3:2004/A1:2011	Adjustable speed electrical power drive systems Part 3: EMC requirements and specific test methods
EN 61800-5-2: 2017 Annex E	Adjustable speed electrical power drive systems Part 5-2: Safety requirements – Functional



## 5.4. Environmental

Specification	Details
IEC60068-2-78	Damp heat, steady state
IEC60068-2-6	Vibration (sinusoidal)
IEC60068-2-2	Dry heat
IEC60068-2-27	Shock

## 5.5. Other Compliant Standards

For other compliant standards refer to the

[MAN-G-Board Level Modules Hardware Manual section 17.7](#) or refer to the Elmo website:

<https://www.elmomc.com/capabilities/standards-compliance/gold-family/>

## 5.6. CE Declaration

Refer to the complete EC Declaration of Conformity available on the internet at:

[https://www.elmomc.com/wp-content/uploads/dlm\\_uploads/2018/05/Gold-Line-CE-Declaration-of-Conformity.pdf](https://www.elmomc.com/wp-content/uploads/dlm_uploads/2018/05/Gold-Line-CE-Declaration-of-Conformity.pdf).

## 5.7. Dual Use

No export license is required for the Gold Line products signified with the suffix Q in the Part Number.

The operating frequency of the Gold Line products is “factory limited” to  $\leq 599$  Hz, and therefore complies with the EU Dual Use Regulation 428/2009, 3A225, and the US Dual Use regulation EAR ECCN# 3A225.

This statement applies to all identical specimens and will become invalid if a change is made in the firmware.



## Chapter 6: Installation

The Gold Solo Twitter must be installed in a suitable environment and properly connected to its voltage supplies and the motor.

### 6.1. Unpacking the Drive Components

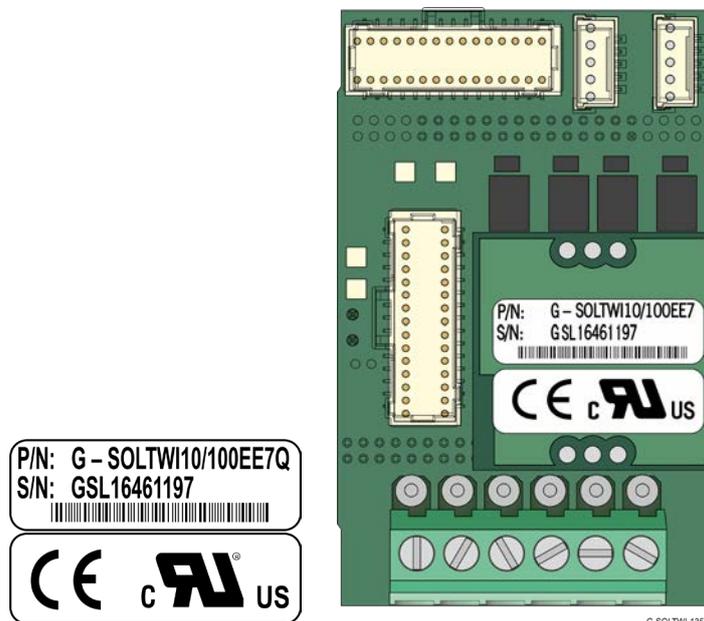
Before you begin working with the Gold Solo Twitter, verify that you have all of its components, as follows:

- The Gold Solo Twitter servo drive
- The Elmo Application Studio (EASII) software and software manual

The Gold Solo Twitter is shipped in a cardboard box with Styrofoam protection.

#### To unpack the Gold Solo Twitter:

1. Carefully remove the servo drive from the box and the Styrofoam.
2. Check the drive to ensure that there is no visible damage to the instrument. If any damage has occurred, report it immediately to the carrier that delivered your drive.
3. To ensure that the Gold Solo Twitter you have unpacked is the appropriate type for your requirements, locate the part number sticker on the top of the Gold Solo Twitter. It looks like this:



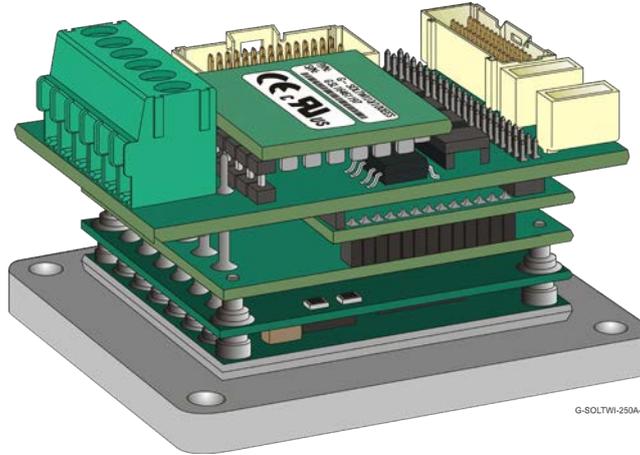
4. Verify that the Gold Solo Twitter type is the one that you ordered, and ensure that the voltage meets your specific requirements.

The part number at the top provides the type designation. Refer to the appropriate part number in the Catalog Number section at the beginning of the installation guide.

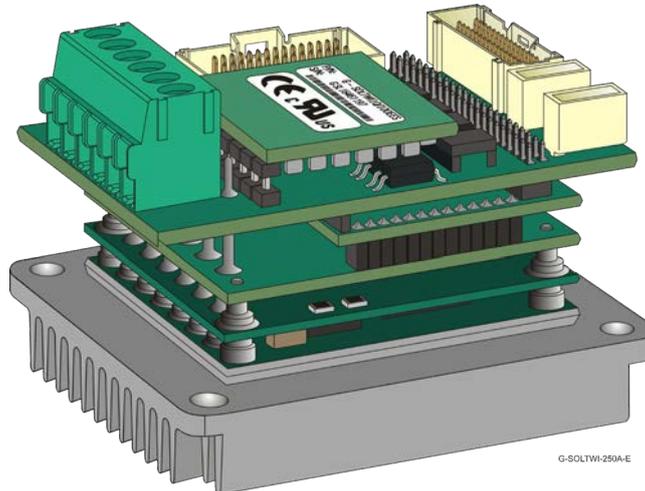


## 6.2. Mounting the Optional Accessories Heat Sinks

There are two optional heat sinks, available as accessory kits (the model Power Supply & Heatsink Option: **H** is integrated with the Flat Heatsink P/N G-TWIHSFLAT01):



**Flat Heat Sink (P/N G-TWIHSFLAT01)**



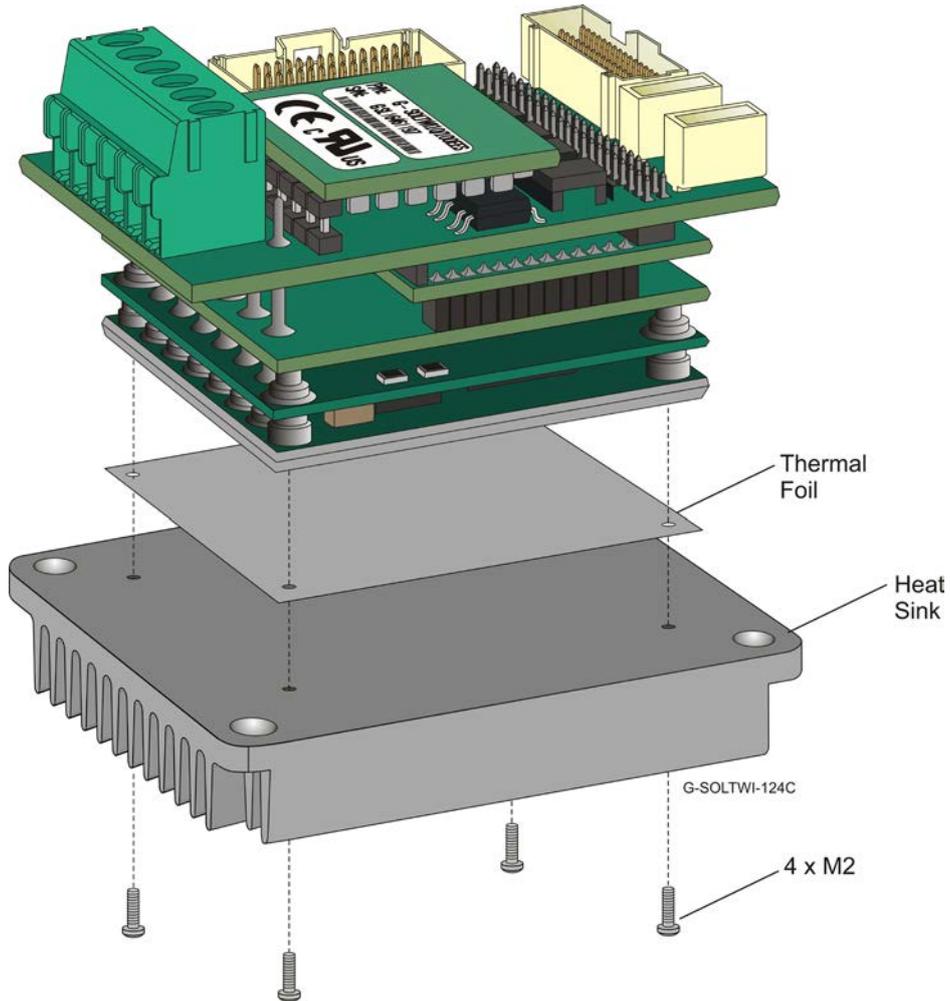
**Fins Heat Sink (P/N G-TWIHSFINS01)**

The optional heat sink must be screwed to the lower surface of the Gold Solo Twitter.



**To mount the accessory heatsink (Not available for the option Power Supply & Heatsink Option: H):**

1. Mount the heat sink under the base of the Gold Solo Twitter.
2. Place the Thermal foil (enclosed in the heat sink accessories kit) between the lower surface of the servo drive, and the upper surface of the heatsink.
3. Use four M2 screws (enclosed in the heat sink accessories kit) to secure the heatsink under the servo drive.
4. Tighten the screws to the relevant torque force applicable to an M2 stainless steel A2 screw.



**Figure 2: Mount the Heat Sink and Thermal Foil to the Gold Solo Twitter**



### 6.3. Mounting Gold Solo Twitter to an External Heatsink

This option is only available for Power Supply & Heatsink Option: **H**.

The selected heat sink must be screwed to the lower surface of the Gold Solo Twitter.

#### To mount the Gold Solo Twitter to an external heat sink:

1. Mount the heat sink under the base of the Gold Solo Twitter.
2. Place the Thermal foil (PN IMT-GTWIALHFLAT purchased from Elmo) between the lower surface of the servo drive, and the upper surface of the heatsink.
3. Use four M2.5 head cup Allen screws to secure the heat sink under the servo drive.
4. Tighten the screws to the relevant torque force applicable to an M2.5 stainless steel A2 screw.

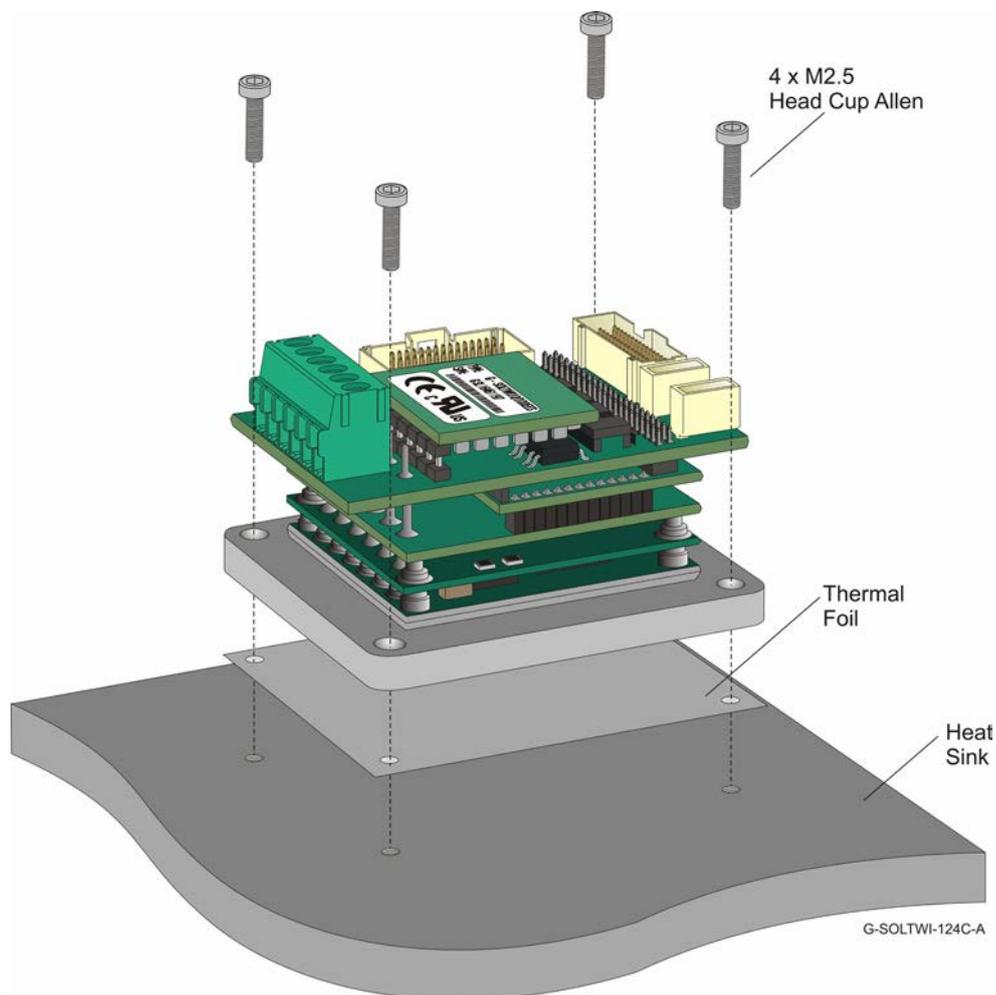
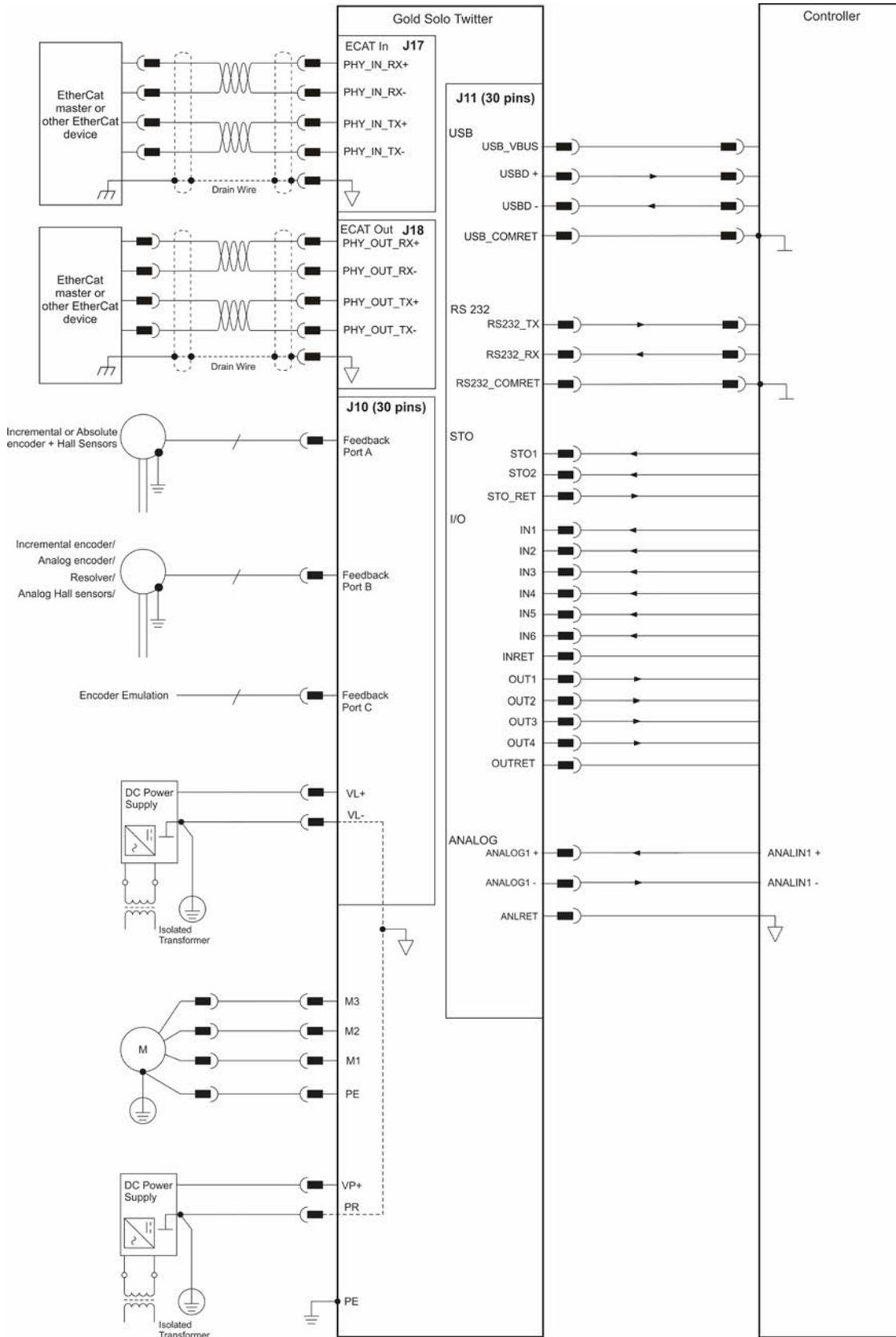


Figure 3: Mounting the Heat Sink and Thermal Foil to the Gold Solo Twitter



## 6.4. The Gold Solo Twitter Connection Diagrams

### 6.4.1. EtherCAT with Molex Connection USB Connection Diagram

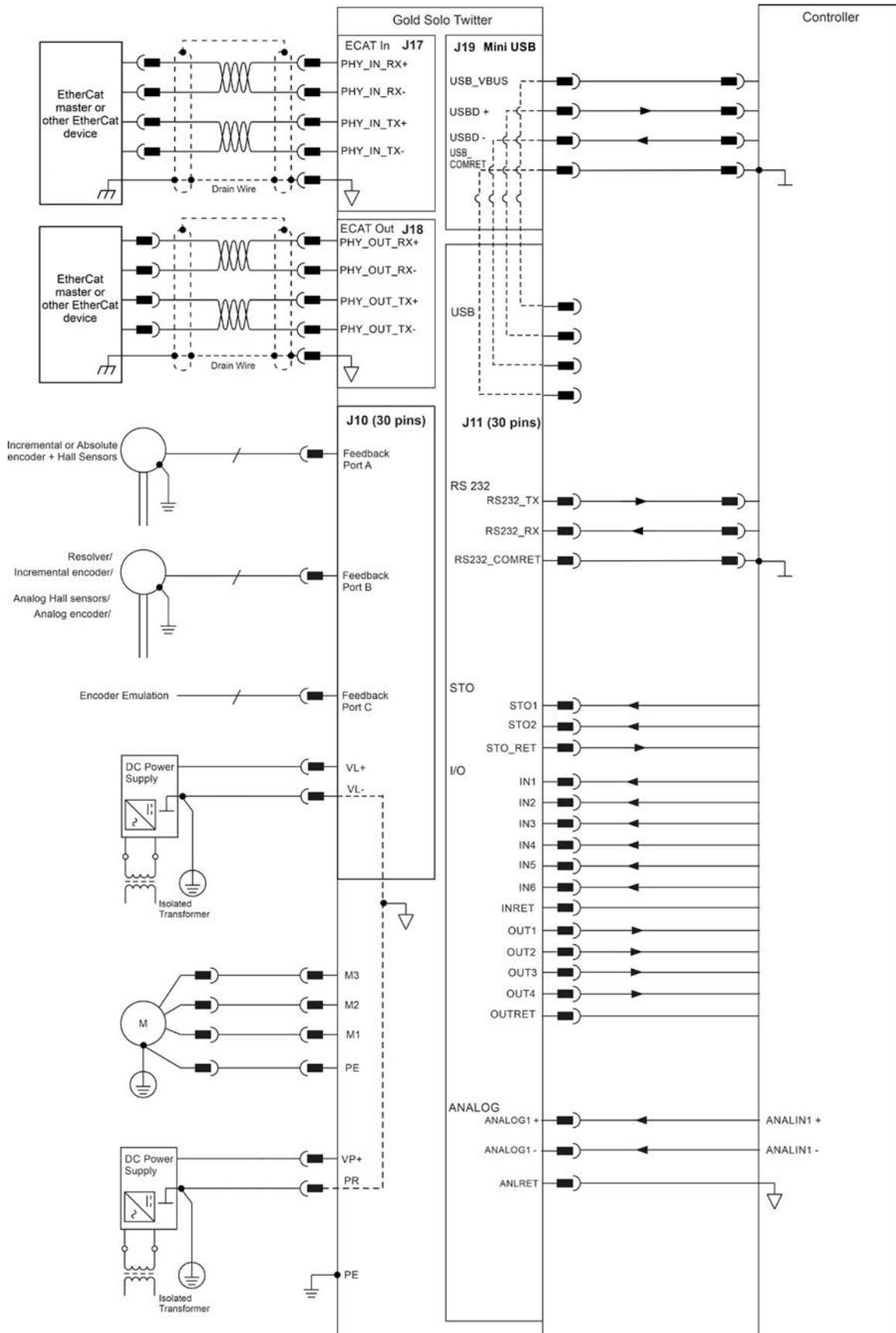


G-SOL\_TWID-001G

Figure 4: The Gold Solo Twitter EtherCAT Connection Diagram (Option E)



### 6.4.2. EtherCAT with Mini USB Connector Connection Diagram

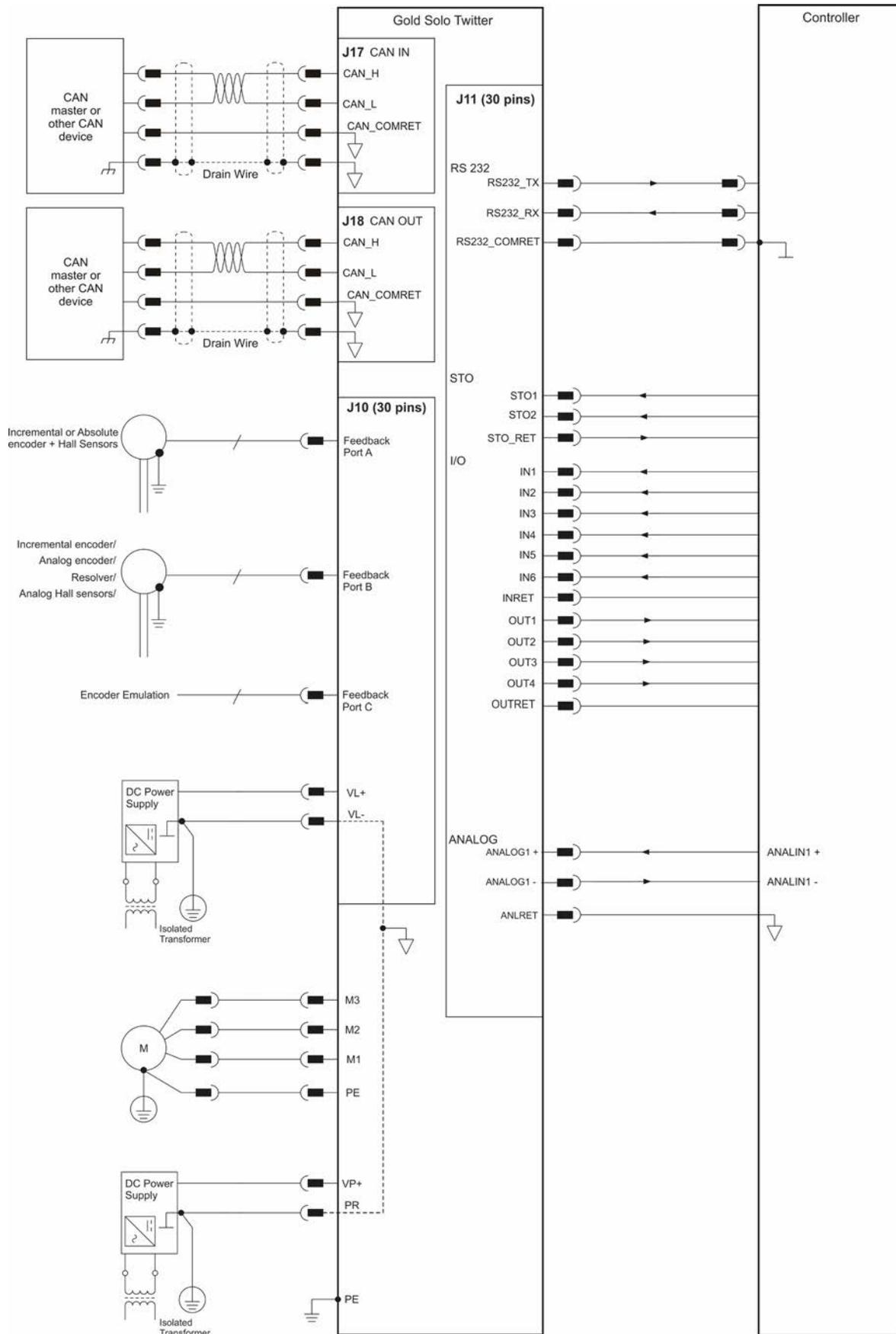


G-SOLTWI\_V5-0213C

Figure 5: The Gold Solo Twitter EtherCAT Connection Diagram (Option M)



### 6.4.3. CAN Connection Diagram



G-SOL\_TWID\_CAN-F

Figure 6: The Gold Solo Twitter CAN Connection Diagram



# Chapter 7: Wiring

## 7.1. Wiring Legend

The following table legend describes the wiring symbols detailed in all installation guides.

Wiring Symbol	Description
<p>GGEN_101D-A</p>	Earth connection (PE)
<p>GGEN_101D-B</p>	Earth Connection
<p>GGEN_101D-C</p>	Common at the Controller
<p>GGEN_101D-D</p> <p>Drain Wire</p>	Shielded cable with drain wire. The drain wire is a non-insulated wire that is in direct contact with the braid (shielding). Shielded cable with drain wire significantly simplifies the wiring and earthing.
<p>GGEN_101D-E</p>	Shielded cable braid only, without drain wire.
<p>GGEN_101D-F</p>	Twisted-pair wires
<p>GGEN_DTYPE101E-Q</p> <p>Encoder Earthing.</p> <p>The cable's shield is connected to the chassis (PE) in the connector.</p> <p>Earthing the Encoder and connecting the Earth (PE) to the drive COMRET is mandatory to insure reliable operation, high noise immunity and rejection of voltage common mode interferences.</p>	



## 7.2. Connector Types

The Gold Solo Twitter has five connectors:

Connector	Connector Type
<b>Power</b>	Wires, Horizontal or Pluggable Vertical Phoenix connector
<b>J10, J11</b>	J10 - VL & Feedback Ports Connector (2 rows x 15 Pins) J11 - IO and Communication Connector (2 rows x 15 Pins)
<b>J17, J18</b>	J17 - CAN/EtherCAT IN Communication J18 - CAN/EtherCAT OUT Communication
<b>J19</b>	J19 – Mini USB (Only for Option M)

## 7.3. Mating Connectors

Connector	Mating Connector Type	Mating Crimping Pins
<b>Power (Vertical model)</b>	PHOENIX 3.5 mm pitch terminal 6-pin plug straight 1840405	N/A
<b>J10, J11 VL &amp; Feedback Ports IO and Communication</b>	MOLEX 1.00mm "Pico-Clasp" 501189-3010	MOLEX 1.00mm crimp terminal 501193-3000
<b>J17, J18 IN/OUT CAN/EtherCAT Communication</b>	MOLEX 1.00mm "Pico-Clasp" 501330-0500	MOLEX 1.00mm crimp terminal 501334-0100

### Connectors Location

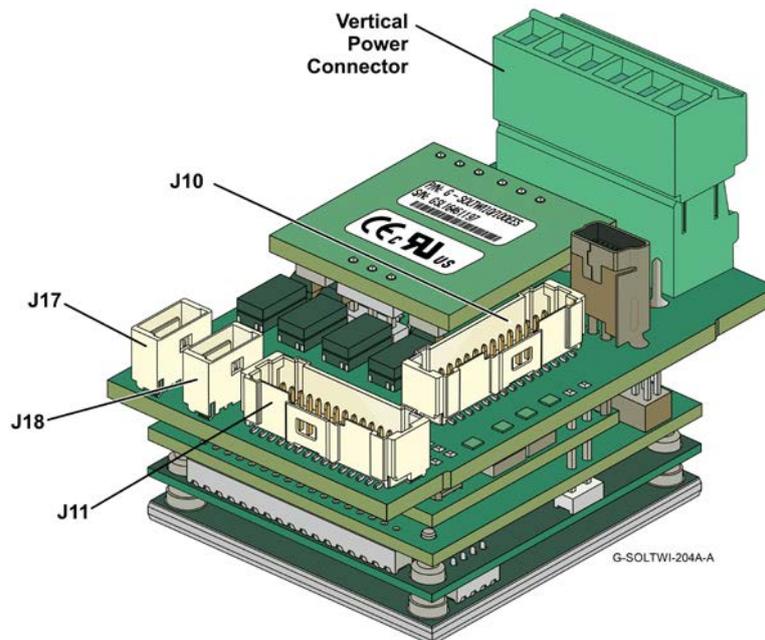


Table 4: Connector Types



## 7.4. Logic and Control Cabling and Wiring

### 7.4.1. J10 and J11 (Feedback ports, VL, RS232, USB, Analog Input)

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.

### 7.4.2. J11 (Digital Inputs/Outputs, STO)

Wires can always be used, no need for twisting, no need for shielding.

### 7.4.3. J17, J18 EtherCAT or CAN Communication

Always use CAT5e cables (see Elmo's Gold Solo Twitter Cable Kit (MAN-G-SOLTWI-CBLKIT)).

### 7.4.4. COMRET to PE Connection

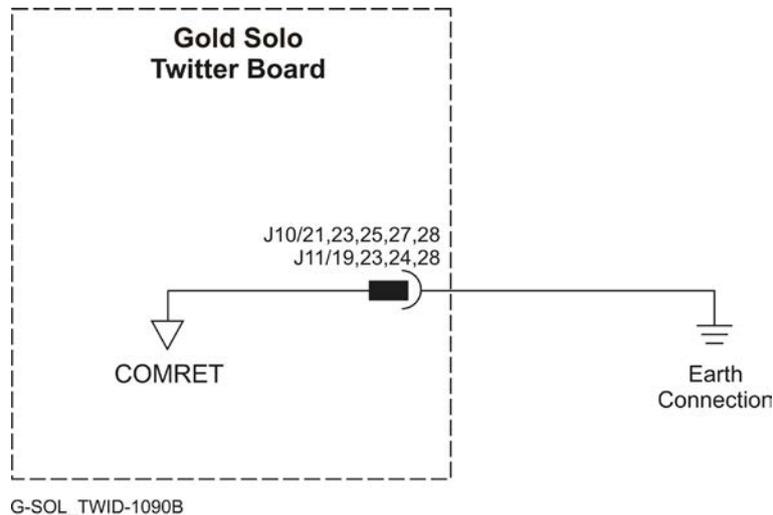


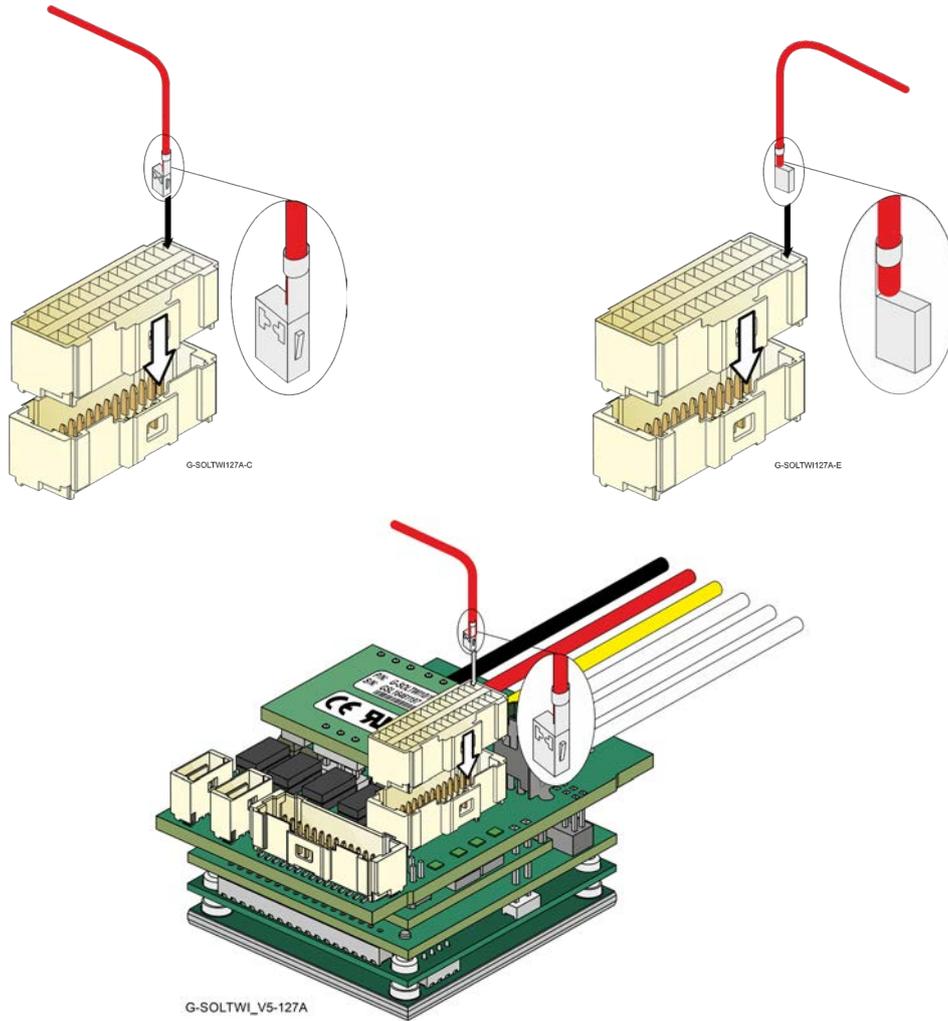
Figure 7: COMRET Connection to the PE

**At least one COMRET pin (Figure 7) must be connected to the Protective Earth (PE).**

Earthing the COMRET by connecting the Earth (PE) to the drive COMRET is mandatory to insure reliable operation, high noise immunity and rejection of voltage common mode interferences.



## 7.5. Wiring the Female Connectors



**Figure 8: Inserting a wire/pin to the Female Connector**

To insert a wire/pin to the female connectors of J10, J11, J17, and J18 do the following:

1. Select the relevantly colored wire to insert to a specific rectangular compartment on the female connector.
2. Use the appropriate Molex crimping plier (Molex P/N 63819-1500) to fasten a pin connector to the end of the wire.
3. Place the connector on a flat surface, in the orientation as shown in Figure 8. Notice that the rectangular slot has a niche at the bottom of the slot.
4. Insert the wire connector to the slot as shown in Figure 8. Make sure that the connector protrusion is inserted to the bottom of the rectangular slot. When inserting the wire connector to a slot in the second row, make sure to rotate the connector in the opposite orientation.
5. Repeat the same procedure for any other wire connections.



## Chapter 8: Connections

### 8.1. Main, Control, and Motor Power

This section describes the Main and Control supplies, and Motor Power connections.

There are three optional Motor and Main Power interfaces:

- The current carrying capacity of the Solo board wires is up to 80A (57A RMS)
- Phoenix horizontal connector on models have an output current of 25A (17.7A RMS) or less
- Phoenix pluggable vertical connector on models have an output current of 10A (7.1A RMS) or less

#### 8.1.1. Motor Power

For full details see Section 7.3 in the manual: MAN-G-Board Level Modules Hardware manual.

Pin	Wire Color	Function	Cable		Pin Positions
			Brushless Motor	Brushed DC Motor	
PE	Yellow	Connection earth	Motor	Motor	
M1	White	Motor phase	Motor	N/C	
M2	White	Motor phase	Motor	Motor	
M3	White	Motor phase	Motor	Motor	

Table 5: Motor Wires or Connector

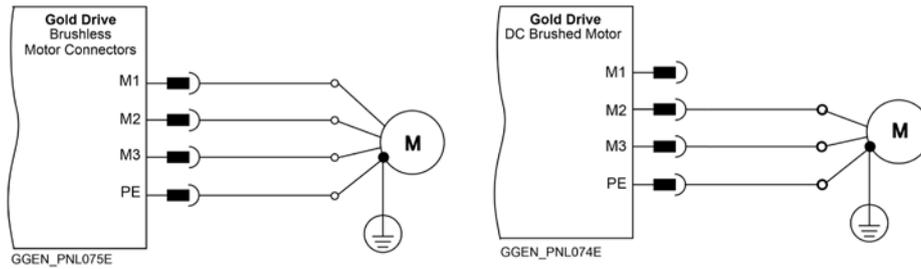


Figure 9: Brushless Motor Power and Brushed Motor Power Connection Diagrams

### 8.1.1.1. Motor Power Connections

1. Ensure that the motor chassis is properly earthed.
2. Connect the appropriate wire from the Motor Power cables to the M1, M2, M3, and PE terminals on the Gold Solo Twitter.

The phase connection is arbitrary as Elmo Application Studio (EAS II) will establish the proper commutation automatically during setup. When tuning a number of drives, you can copy the setup file to the other drives and thus avoid tuning each drive separately. In this case the motor-phase order must be the same as on the first drive.

3. For high EMI environment, it is highly recommended to use a 4-wire shielded (not twisted) cable for the motor connection. The gauge is determined by the actual RMS current consumption of the motor.

Connect the cable shield to the closest ground connection at the motor end.

For better EMI performance, the shield should be connected to Earth Connection (heat sink mounting holes).

4. Connect the motor power wires as shown in Figure 10. The Yellow wire is the Grounding wire.

Make sure not to bundle the wires.

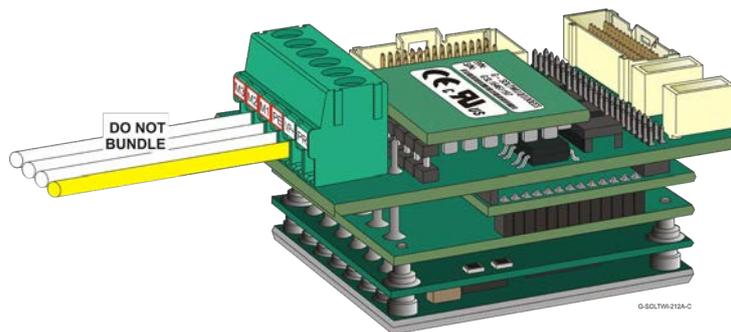


Figure 10: Connecting the Motor Power Wires



### 8.1.2. Main Power Wires & Connector

This section describes the Main Power and the Control supply connector.

#### 8.1.2.1. Main Power

The isolated DC power source is not included with the Gold Solo Twitter.

Pin	Wire Color	Function	Cable	Pin Positions
VP+	Red	DC Pos. Power input	Power	
PR	Black	Power return	Power	
PE	Yellow	Connection earth	Power	

Table 6: Connector or Wires for Main Power

Connect the DC power cable to the VP+ and PR terminals on the main power connector.

**To connect the Gold Solo Twitter to the DC power source:**

1. The source of the VDC power supply must be isolated from the Mains.
2. Verify that the rectified VDC is indeed within the range of the drive.
3. Connect the VP+ and PR wires to the terminals on the servo-drive as shown in Figure 11. It is highly recommended to twist the two DC main power cables at intervals of 10 cm.

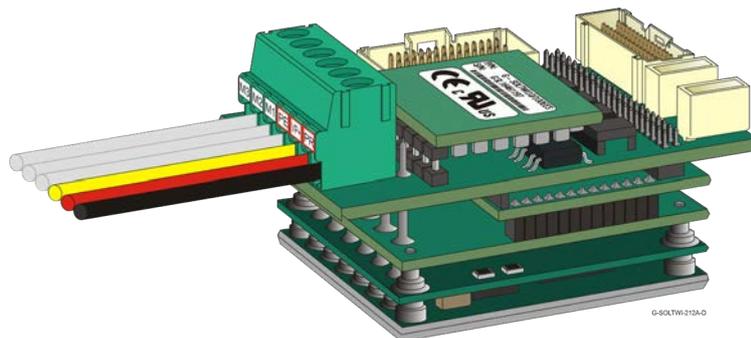


Figure 11: Connecting the Main Power Wires



4. Connect the PE to the closest earth connection near the power supply.
5. Connect the PR to the closest earth connection near the power supply.
6. Before applying power, first verify the polarity of the connection.

#### **8.1.2.2. Wiring Technical Details**

The six 14-AWG, silicon insulated, 300mm length colored high quality, power connection wires are rated to operate up to 200°C:

The Gold Solo Twitter wire connection conforms to UL standards for operation up to 105°C (on the wires). Under extensive load conditions the wires temperature gradient is  $\approx 50$  °C above ambient.



### 8.1.3. Control Supply (J10)

Connect the VL+ and VL- pins on the Gold Solo Twitter in the manner described in the table and drawing below.

Pin	Signal	Function	Pin Positions
30	VL+	Control Supply Input	
29	VL-	Control Supply Return	
<ol style="list-style-type: none"> <li>Standard CAN (Power Supply &amp; Heatsink Option: <b>(Blank)</b>) Input range: 12 – 40VDC Power consumption: &lt;2.5W (including up to 200mA@5V for encoder)</li> <li>EtherCAT (<b>E</b> or <b>M</b> option) (Power Supply &amp; Heatsink Option: <b>(Blank)</b>) Input range: 14 – 40VDC Power consumption: &lt;4W (including up to 200mA@5V for encoder)</li> <li>Standard CAN (Power Supply &amp; Heatsink Option: <b>S</b> or <b>H</b>) Input range: 12 – 95VDC Power consumption: &lt;2.5W (including up to 200mA@5V for encoder)</li> <li>EtherCAT (<b>E</b> or <b>M</b> option) (Power Supply &amp; Heatsink Option: <b>S</b> or <b>H</b>) Input range: 12 – 95VDC Power consumption: &lt;4W (including up to 200mA@5V for encoder)</li> </ol>			

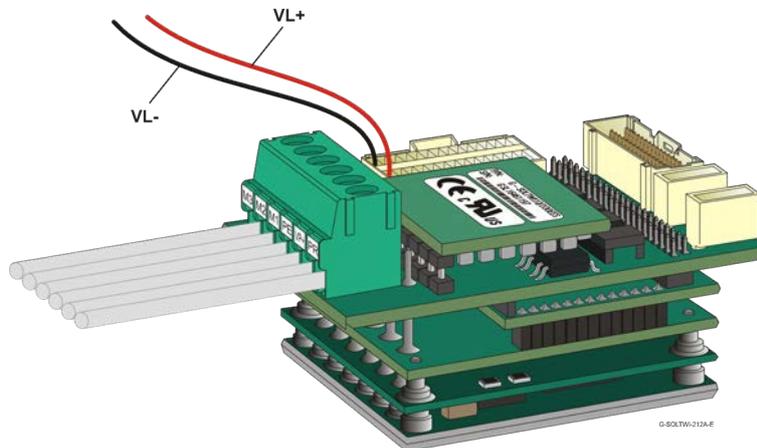
Table 7: Control Supply Pins



Connect the VL+ and VL- terminals to the power supply Control Connector.

**To connect the VL+ and VL- to the control supply:**

1. The source of the control supply must be isolated from the Mains.
2. Connect the return (common) of the control supply source to the closest earth connection near the control supply source.
3. Connect the VL+ and VL- wires to the terminals on the servo-drive as shown in Figure 12.



**Figure 12: Connecting the Control Supply Wires**

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.

4. Before applying power, first verify the polarity of the connection.

**Note:** For VL 12 to 40VDC (Power Supply & Heatsink Option: **(Blank)**) refer to section 8.1.4.

For VL 12 to 95VDC (Power Supply & Heatsink Option: **S** or **H**) refer to section 8.1.5.

### 8.1.4. Control Supply Connections for Power Supply & Heatsink Option: **(Blank)**

**Note:** This section is for VL 12 to 40VDC.

For VL 12 to 95VDC (Power Supply & Heatsink Option: **S** or **H**) refer to section 8.1.5.

#### 8.1.4.1. Dual Power Supply

Whenever the VP+ is >40VDC, a separate supply for the Logic is required. Both the Power and Logic supplies are required to be isolated-from-the-mains:

- A battery or main DC power source rectified from the Mains, according to specification
- A control supply for the logic (VL+, VL-)

The following figure describes an ordinary power supply for Servo drives with sufficient internal capacitance and shunt regulator to manage power flow in both directions to-and-from the motor.

**Note:** The PR, COMRET, and VL- are connected internally in the Gold Solo Twitter.

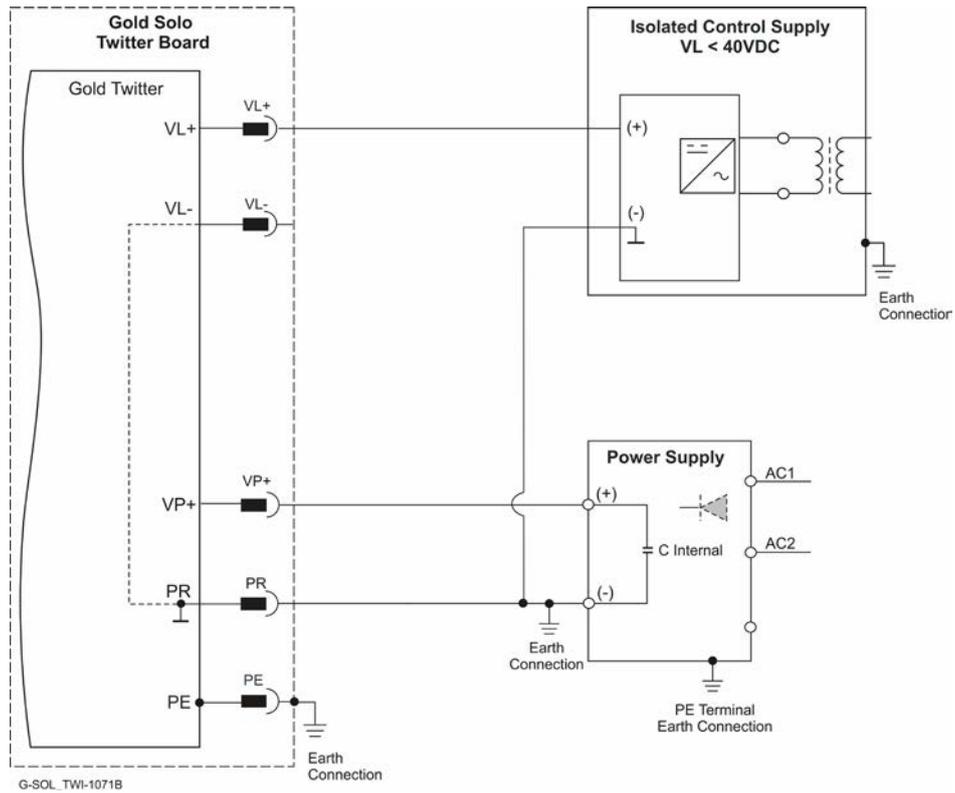


Figure 13: Separate VP and VL Power Supplies Connection Diagram –Highly Recommended

The (+) of the control power supply is connected to the VL+ terminal, while the (-) of the control power supply is connected directly to the (-) of the DC bus power supply. This connection avoids high current ground loops due to poor wiring (Figure 13).

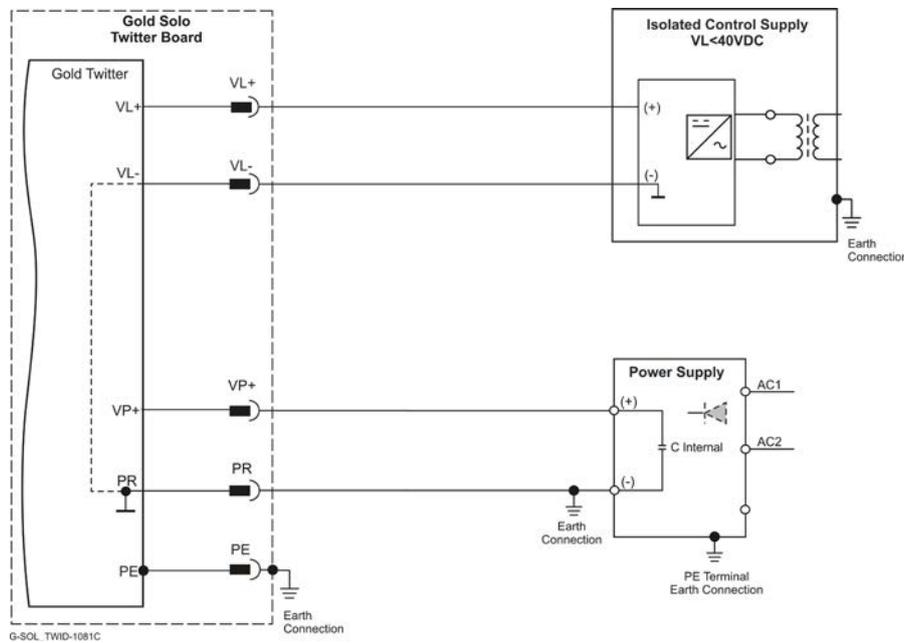


Figure 14: Separate VP and VL Power Supplies Connection Diagram - Alternative

The (-) of the control power supply is connected to the VL- of the Gold Solo Twitter (Figure 14).



### 8.1.4.2. Single Power Supply (VP+ < 40VDC)

Where a single power supply is used (VL+ connected to VP+), the absolute maximum VP+ and VL+ voltage must be < 40VDC, under all conditions, to prevent VL+ supply failure.

**When regeneration or braking occurs, the DC bus may increase and may exceed the VL limit of over 40VDC, possibly causing the VL to fail. Under these conditions, you must install the Dual Power Supply described above in section 8.1.4.1.**

**Note:** For the EtherCAT (E or M option), the minimum VL is 14 VDC.

For the CAN version power rating of 12 to 40VDC, or 14 to 40VDC for the EtherCAT version, a single power supply can be used for the main and control power.

The following figure describes a single connection of main power and control.

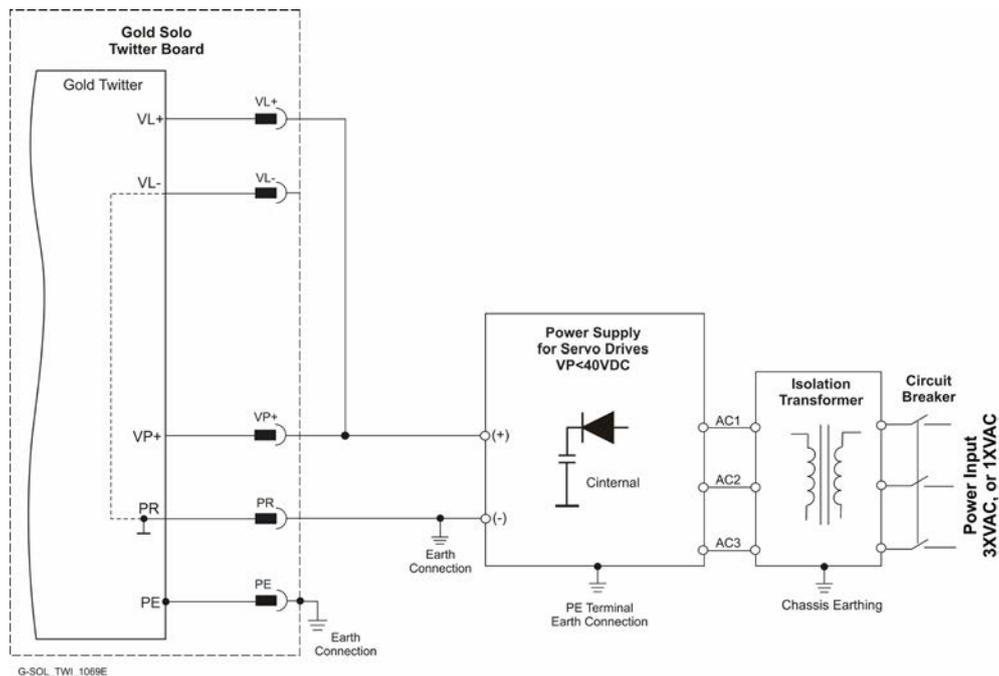


Figure 15: Single Power Supply (VP+ <40V) Connection Diagram

**Note:** This option is available for power supply up to 40VDC.



### 8.1.5. Control Supply Connections for Power Supply & Heatsink Option: S or H

**Note:**

This section is for VL 12 to 95VDC.

For VL 12 to 40VDC (Power Supply & Heatsink Option: **(Blank)**) refer to section 8.1.4.

#### 8.1.5.1. Dual Power Supply

Whenever the VP+ is >95VDC, a separate supply for the Logic is required. Both the Power and Logic supplies are required to be isolated-from-the-mains:

- A battery or main DC power source rectified from the Mains, according to specification
- A control supply for the logic (VL+, VL-)

The following figure describes an ordinary power supply for Servo drives with sufficient internal capacitance and shunt regulator to manage power flow in both directions to-and-from the motor.

**Note:**

The PR, COMRET, and VL- are connected internally in the Gold Solo Twitter.

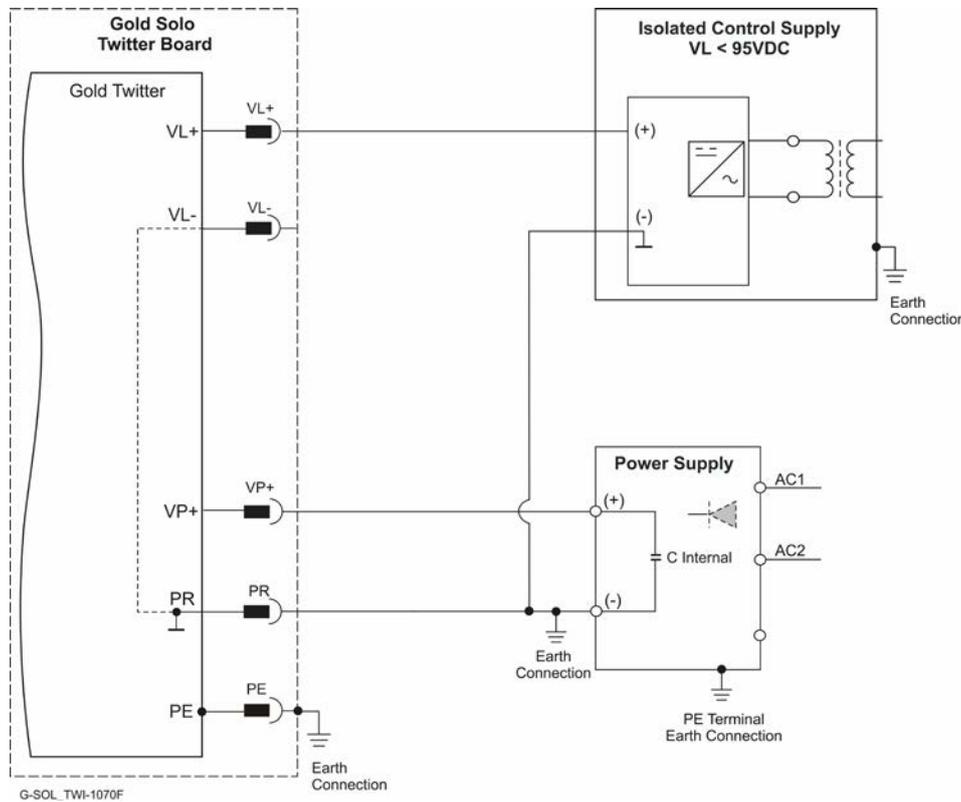


Figure 16: Separate VP and VL Power Supplies Connection Diagram –Highly Recommended

The (+) of the control power supply is connected to the VL+ terminal, while the (-) of the control power supply is connected directly to the (-) of the DC bus power supply. This connection avoids high current ground loops due to poor wiring (Figure 16).

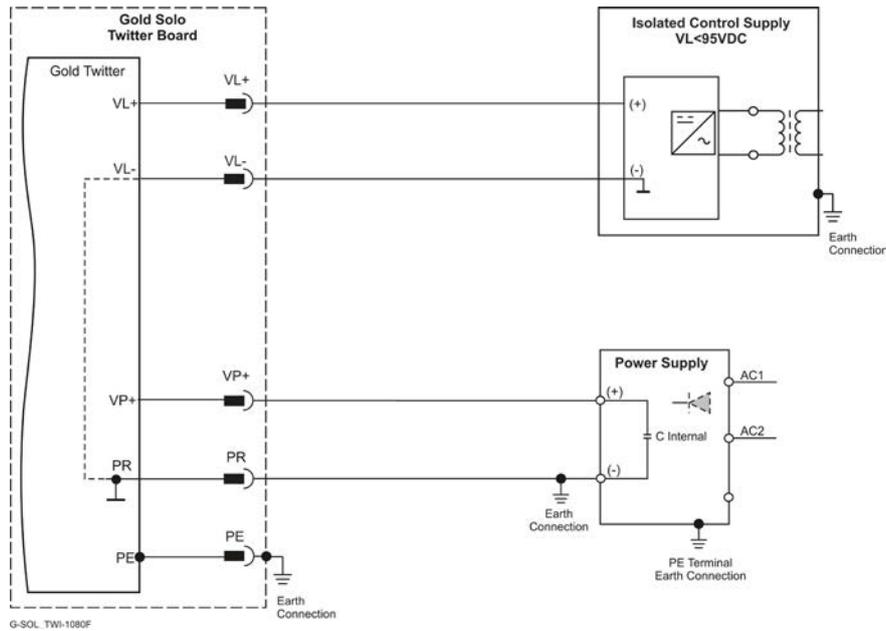


Figure 17: Separate VP and VL Power Supplies Connection Diagram - Alternative

The (-) of the control power supply is connected to the VL- of the Gold Solo Twitter (Figure 17).

### 8.1.5.2. Single Power Supply (VP+ < 95VDC)

Where a single power supply is used (VL+ connected to VP+), the absolute maximum VP+ and VL+ voltage must be < 95VDC, under all conditions, to prevent VL+ supply failure.

A single power supply can be used for the main and control power in the range of 12 to 95VDC.

The following figure describes a single connection of main power and control.

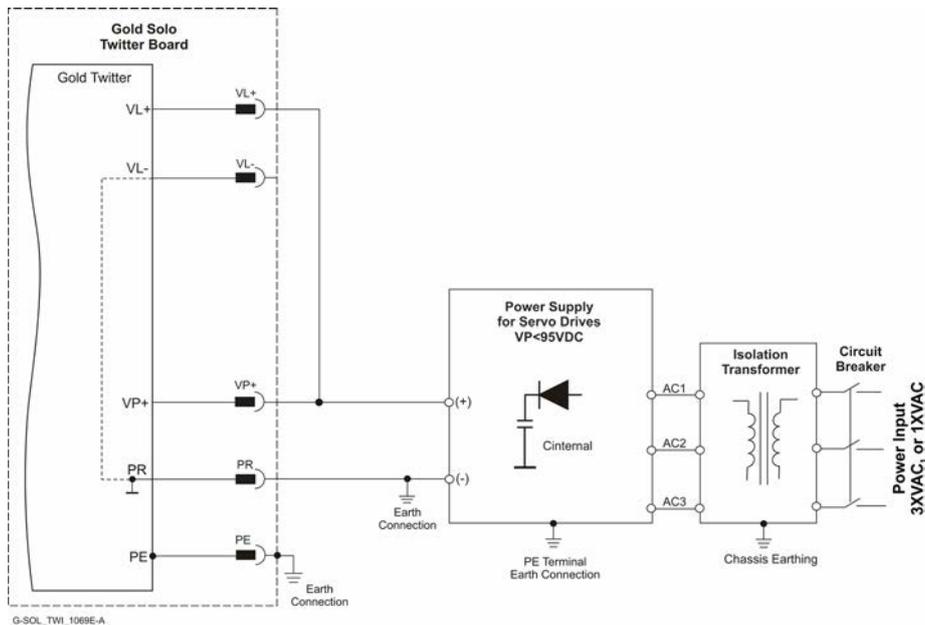


Figure 18: Single Power Supply (VP+ <95V) Connection Diagram

**Note:** This option is available for power supply up to 95VDC.



## 8.2. Drive Status Indicator

Figure 20 shows the position of the D1 red/green dual LED, which is used for immediate indication of the Initiation and Working states. For details refer to Chapter 7 Drive Status Indicator, in the MAN-G-Panel Mounted Drives Hardware manual.

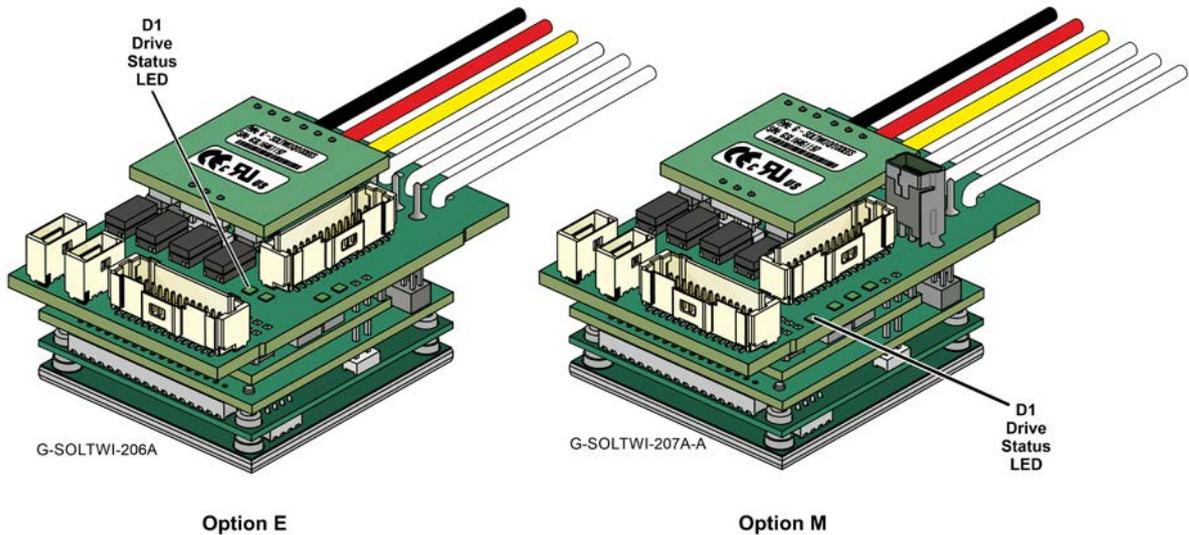


Figure 19: Drive Status Indicator – EtherCAT (options E and M)

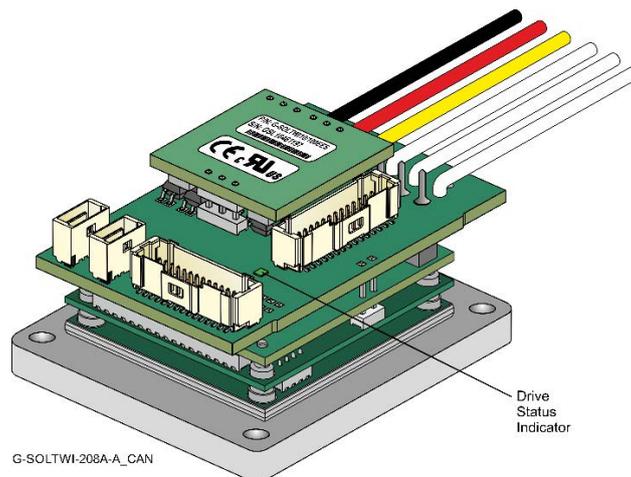


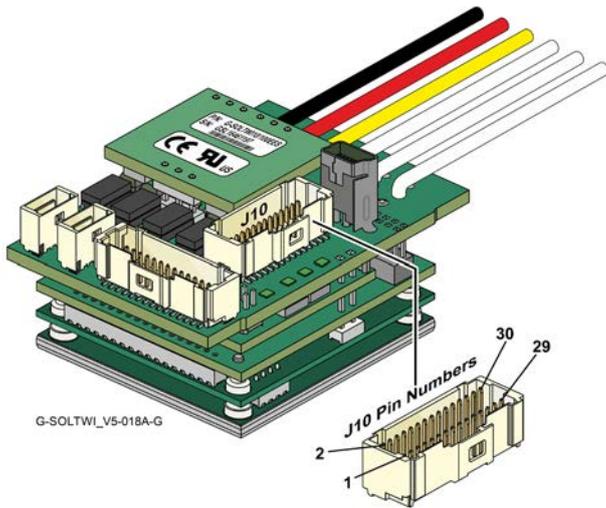
Figure 20: Drive Status Indicator - CAN (Option S) (with heat sink)

The red/green dual LED is used for immediate indication of the following states:

- **Initiation state:** In this state the LED indicates whether the drive is in the boot state (blinking red) or in the operational state (steady red).
- **Working state:** In this state the LED indicates whether the drive is in an amplifier failure state (red) or is ready to enable the motor (green).



### 8.3. J10 VL and Feedback Connector



**Feedback A/B/C, Digital Halls**  
– see Section 9.2 in the manual: MAN-G-Board Level Modules Hardware Manual.

**J10 VL & Feedback Connector**

The following table describes the J10 VL and Feedback connections to the 2 x 15 pins female connector.

Pin J10	Signal	Function
1	PortA_ENC_A+ / ABS_CLK+	Channel A+ / Abs encoder clock +
2	PortB_ENC_A-	Port B Channel A-
3	PortA_ENC_A- / ABS_CLK-	Channel A- / Abs encoder clock -
4	PortB_ENC_A+	Port B Channel A+
5	PortA_ENC_B+ / ABS_DATA+	Channel B+ / Abs encoder data +
6	PortB_ENC_B-	Port B Channel B-
7	PortA_ENC_B- / ABS_DATA-	Channel B- / Abs encoder data -
8	PortB_ENC_B+	Port B Channel B+
9	PortA_ENC_INDEX+	Index+
10	PortB_ENC_INDEX-	Port B Index-
11	PortA_ENC_INDEX-	Index-
12	PortB_ENC_INDEX+	Port B Index+
13	HA	Hall sensor A
14	PortC_ENCO_A-	Buffered Channel A- output / Pulse- / PWM-
15	HB	Hall sensor B
16	PortC_ENCO_A+	Buffered Channel A+ output/Pulse+/PWM+



Pin J10	Signal	Function
17	HC	Hall sensor C
18	PortC_ENCO_B-	Buffered Channel B- output / Dir-
19	+5V	Encoder +5V supply with a total allowable maximum consumption of 200mA using Pins 19 or 26.
20	PortC_ENCO_B+	Buffered Channel B+ output / Dir+
21	COMRET	Common return
22	PortC_ENCO_Index-	Buffered Channel INDEX- output
23	COMRET	Common return
24	PortC_ENCO_Index+	Buffered Channel INDEX+ output
25	COMRET	Common return
26	+5V	Encoder +5V supply with a total allowable maximum consumption of 200mA using Pins 19 or 26.
27	COMRET	Common return
28	COMRET	Common return
29	VL-	Control 24V supply return
30	VL+	Control 24V supply

Table 8: Connector J10 – VL & Feedback

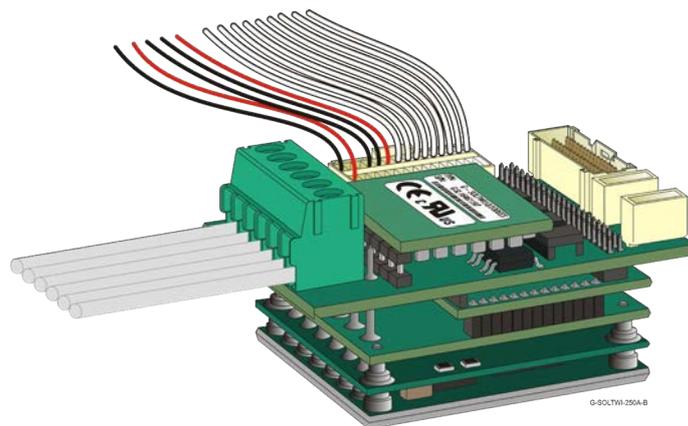


Figure 21: Connecting the Feedback Wires

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.3.1. Port A

Refer to section 10.3 in the MAN-G-Board Level Modules Hardware Manual for further details of the Port A connections.

#### 8.3.1.1. Incremental Encoder

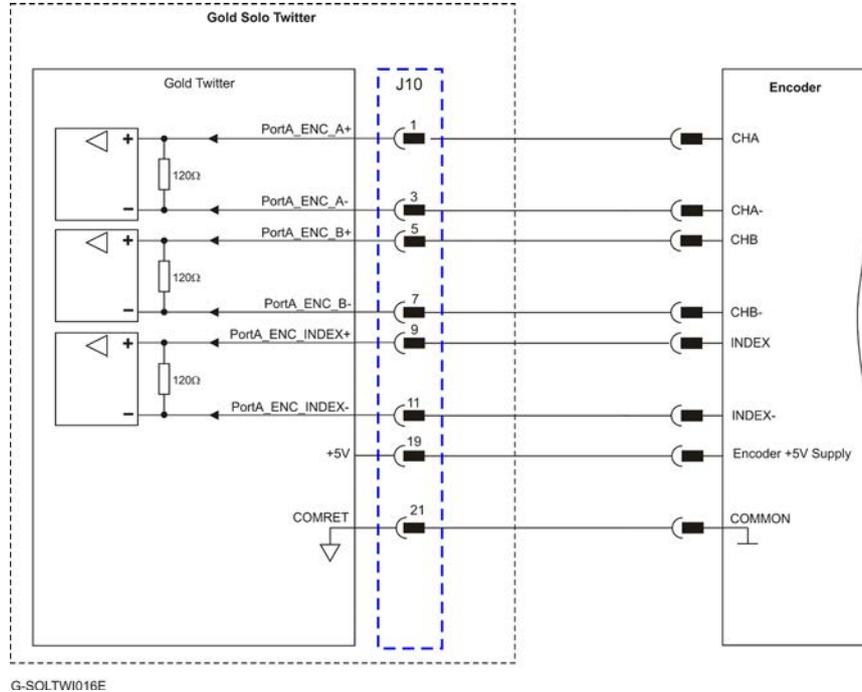


Figure 22: Port A Incremental Encoder Input – Recommended Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.3.1.2. Absolute Serial Encoder

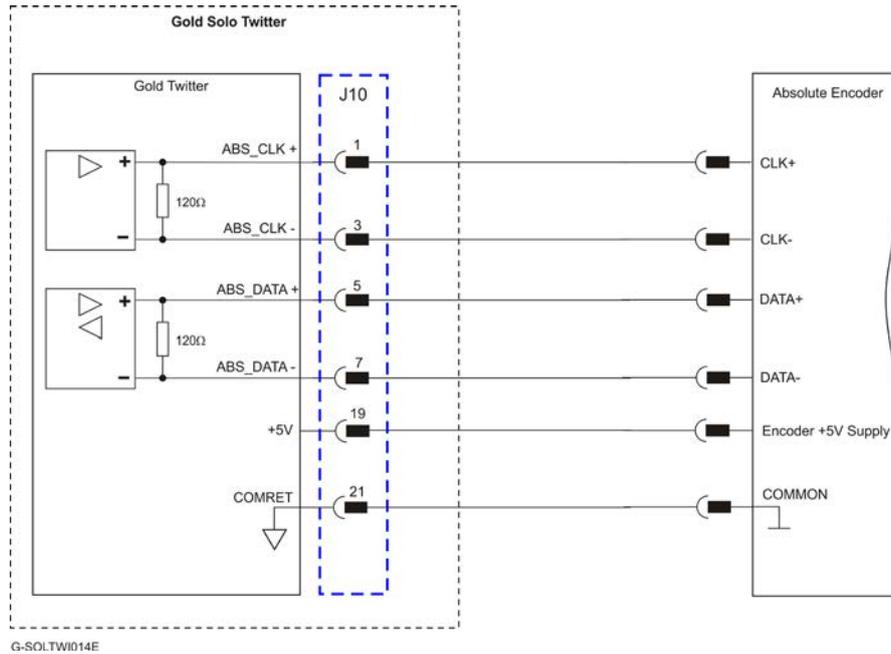


Figure 23: Absolute Serial Encoder – Recommended Connection Diagram for Sensors Supporting Data/Clock (e.g., Biss / SSI / EnDAT, etc.)

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.

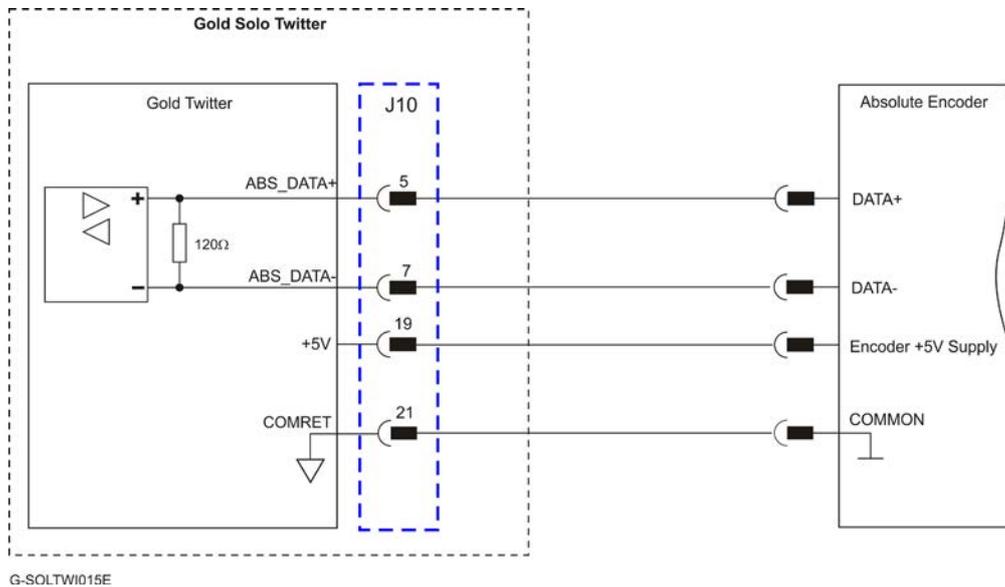


Figure 24: Absolute Serial Encoder – Recommended Connection Diagram for Sensors Supporting Data Line Only (NRZ types, e.g., Panasonic / Mitutoyo / etc.)

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.3.1.3. Hall Sensors

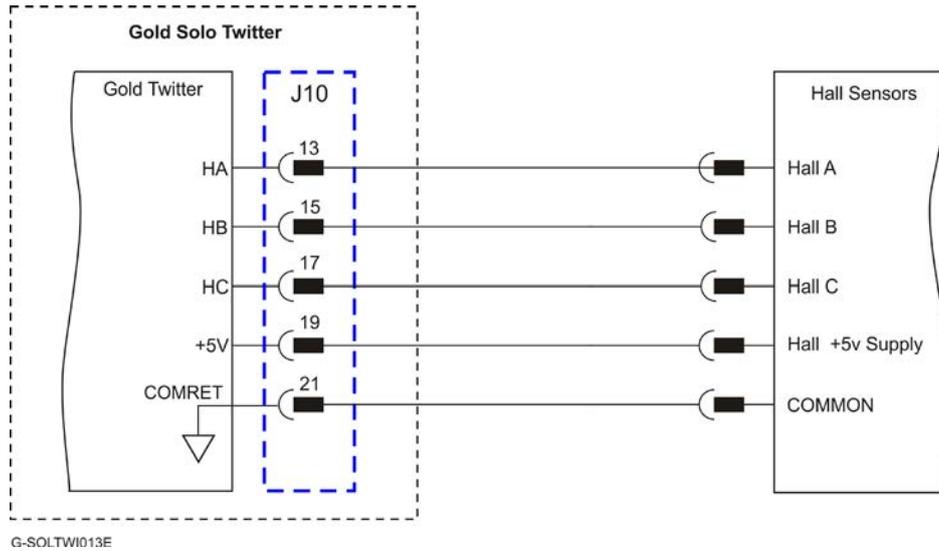


Figure 25: Hall Sensors Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.3.2. Port B

Refer to section 10.4 in the MAN-G-Board Level Modules Hardware Manual for further details of the Port B connections.

#### 8.3.2.1. Incremental Encoder

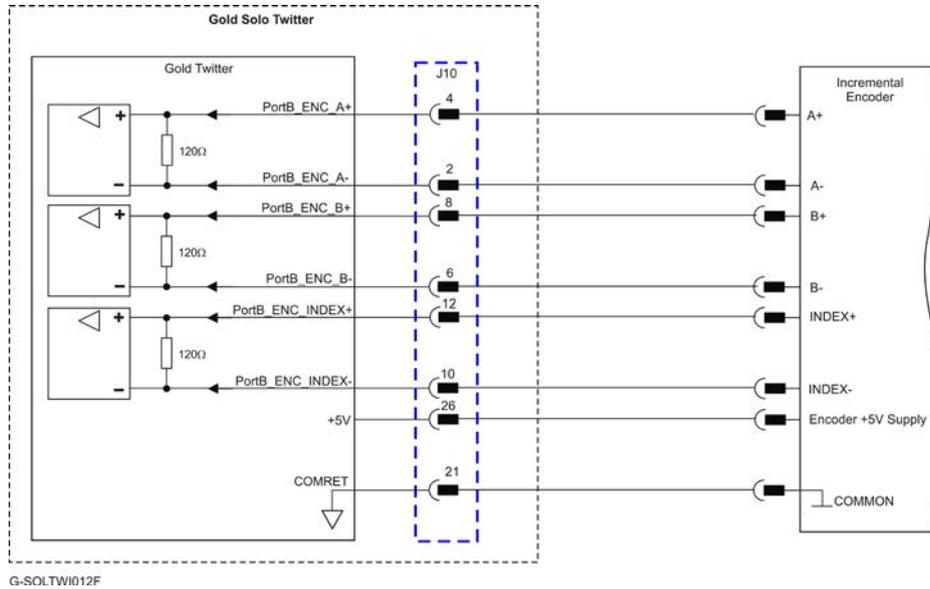


Figure 26: Port B Incremental Encoder Input – Recommended Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.

#### 8.3.2.2. Interpolated Analog Encoder

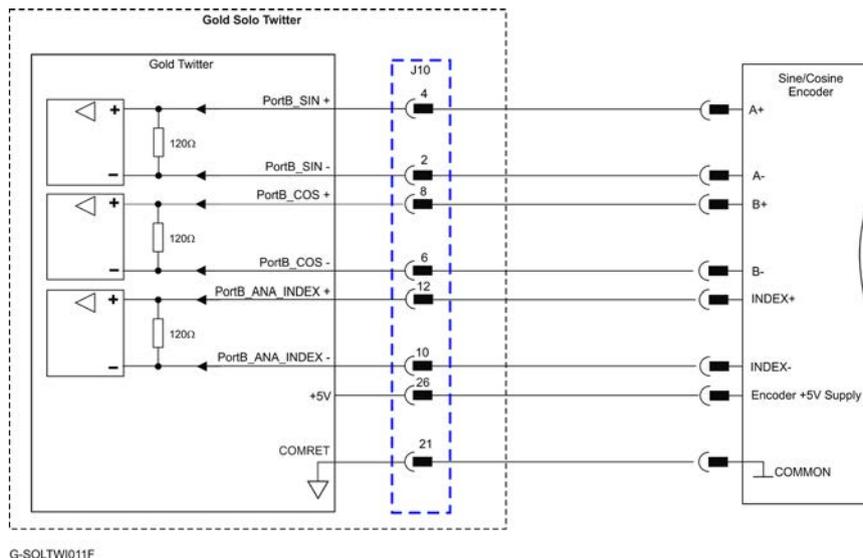


Figure 27: Port B - Interpolated Analog Encoder Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.3.2.3. Resolver

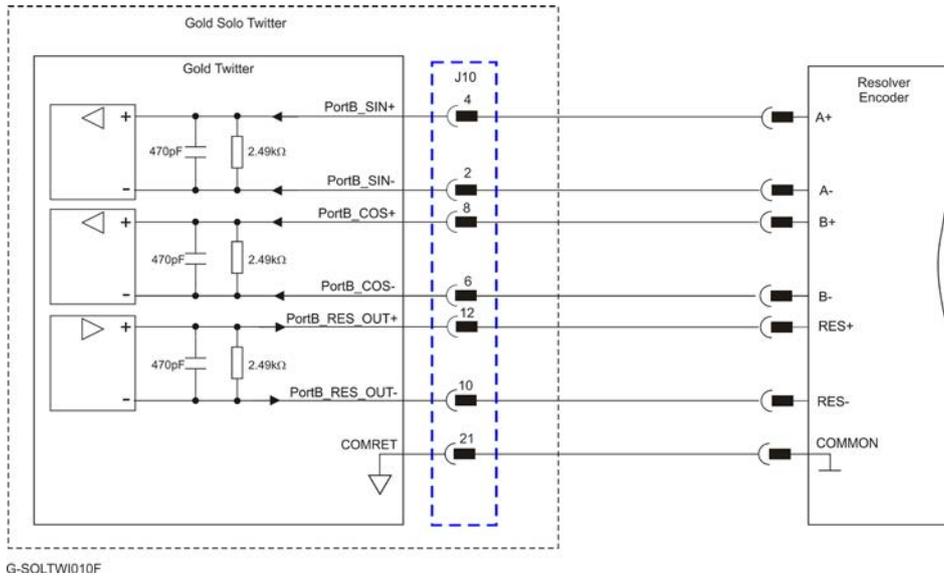


Figure 28: Port B – Resolver Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.3.3. Port C – Emulated Encoder Output (J10)

See Section 10.5 in the manual: MAN-G-Board Level Modules Hardware Manual for further details of Port C.

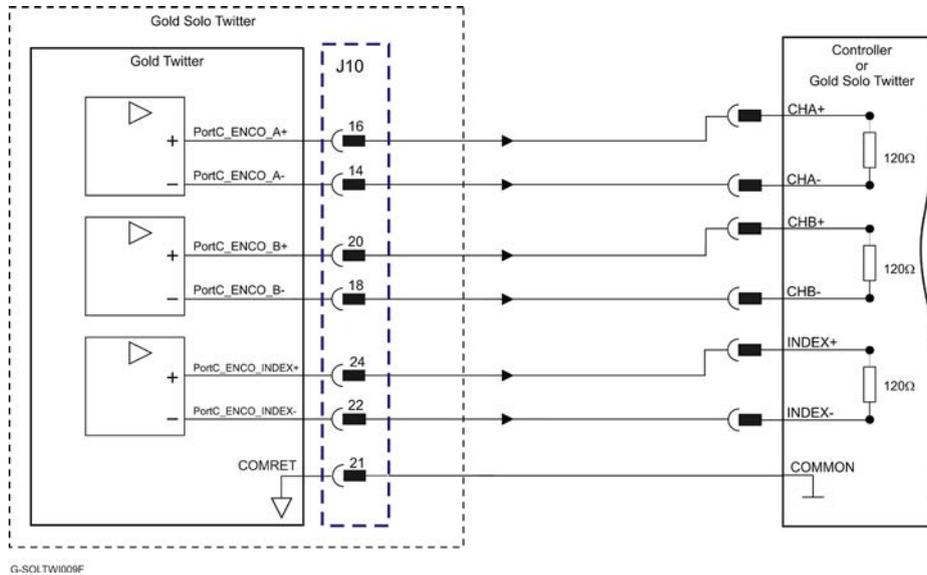
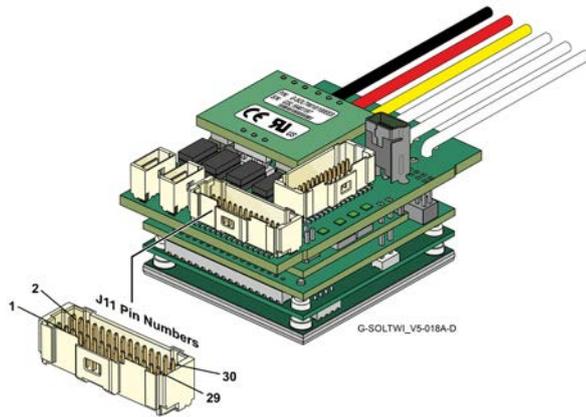


Figure 29: Emulated Encoder Differential Output – Recommended Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.4. J11 I/O and Communication Connector



**STO (safety):** For full details on STO, see Chapter 9 in the in the MAN-G-Board Level Modules Hardware manual for full details.

**J11 I/O and Communication Connector**

Pin J11	Signal	Function
1	IN1	High speed programmable digital input 1 (opto isolated from control COMRET)
2	IN2	High speed programmable digital input 2 (opto isolated from control COMRET)
3	IN3	High speed programmable digital input 3 (opto isolated from control COMRET)
4	IN4	High speed programmable digital input 4 (opto isolated from control COMRET)
5	IN5	High speed programmable digital input 5 (opto isolated from control COMRET)
6	IN6	High speed programmable digital input 6 (opto isolated from control COMRET)
7	INRET	D <sub>in</sub> return
8	INRET	D <sub>in</sub> return
9	OUT1	Programmable output 1 (opto isolated from control COMRET)
10	OUT2	Programmable output 2 (opto isolated from control COMRET)
11	OUT3	Programmable output 3 (opto isolated from control COMRET)
12	OUT4	Programmable output 4 (opto isolated from control COMRET)
13	OUTRET	D <sub>out</sub> return
14	OUTRET	D <sub>out</sub> return
15	STO1	STO 1 input opto isolated from control COMRET
16	STO2	STO 2 input opto isolated from control COMRET



Pin J11	Signal	Function
17	STO_RET	STO signal return. The two digital STO inputs are optically isolated from the other parts of the drive, and share one return line.
18	STO_RET	STO signal return. The two digital STO inputs are optically isolated from the other parts of the drive, and share one return line.
19	COMRET	Common return
20	ANALOG_IN2	Analog input 2
21	ANALOG1+	Analog input 1
22	ANALOG1-	Analog input 1 complement
23	COMRET	Common return
24	COMRET	Common return
25	RS-232_TX	RS-232 Transmit
26	RS-232_RX	RS-232 Receive
27	USB_VBUS	USB VBUS detector (Only for EtherCAT version)
28	COMRET	Common return
29	USB D+	USB _P line (Only for EtherCAT version)
30	USB D-	USB _N line (Only for EtherCAT version)

Table 9: I/O, STO, Analog, RS-232, and USB Connector

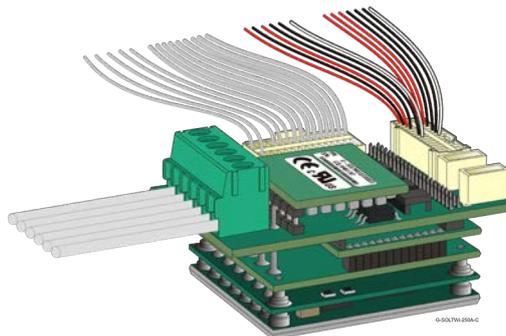


Figure 30: Connecting the USB, RS232, and Analog Input Wires

**For USB, RS232, and Analog Input Wires**

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.

**For Digital Inputs/Outputs, STO**

Wires can be always used, no need for twisting, no need for shielding.



### 8.4.1. Digital Inputs

#### 8.4.1.1. Source PLC Voltage Level Digital Input

Feature	Details
Standard	Isolated PLC source Conforming to IEC 61131-2
Input current	$I_{in} = (V_{in}-7.4)/4.99 \text{ Kohm}$ $I_{in} = 920 \text{ uA @ } V_{in} = 12 \text{ V}$ $I_{in} = 4.5 \text{ mA @ } V_{in} = 30 \text{ V}$
High-level input voltage	$12 \text{ V} < V_{in} < 30 \text{ V}$
Low-level input voltage	$0 \text{ V} < V_{in} < 7 \text{ V}$
Minimum pulse width	$>250 \text{ } \mu\text{sec}$
Execution time (all inputs): the time from application of voltage on input until execution is complete	$0 < T < 250 \text{ } \mu\text{sec}$
High-speed inputs – 1–6 minimum pulse width, in high-speed mode	$T > 5 \text{ } \mu\text{sec}$ if the input functionality is set to latch/capture (index/strobe). <b>Notes:</b> <ul style="list-style-type: none"> <li>Home mode is high-speed mode and can be used for fast capture and precise homing.</li> <li>Highest speed is achieved when turning on optocouplers.</li> </ul>
Capture with differential input Port A, Port B Index	$T > 0.1 \text{ } \mu\text{sec}$ if the differential input functionality is set to touch probe/capture (index/strobe).

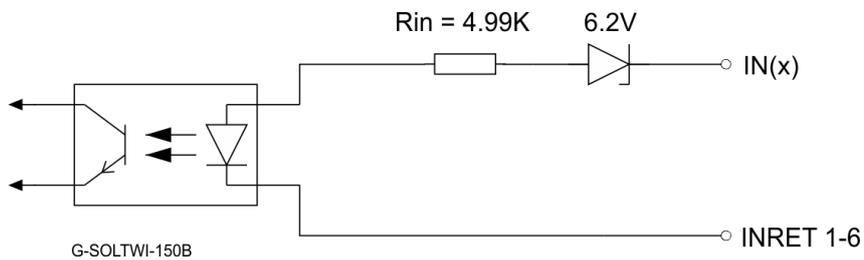


Figure 31: Digital Input PLC Source Schematic

**NOTE:** In the default state, when there is no current in the optocoupler diode of GOLD SOLTWI OPTO, the digital input is "1". It is possible to change the default state by the IL[] command.



The following are the connection diagram of Digital inputs:

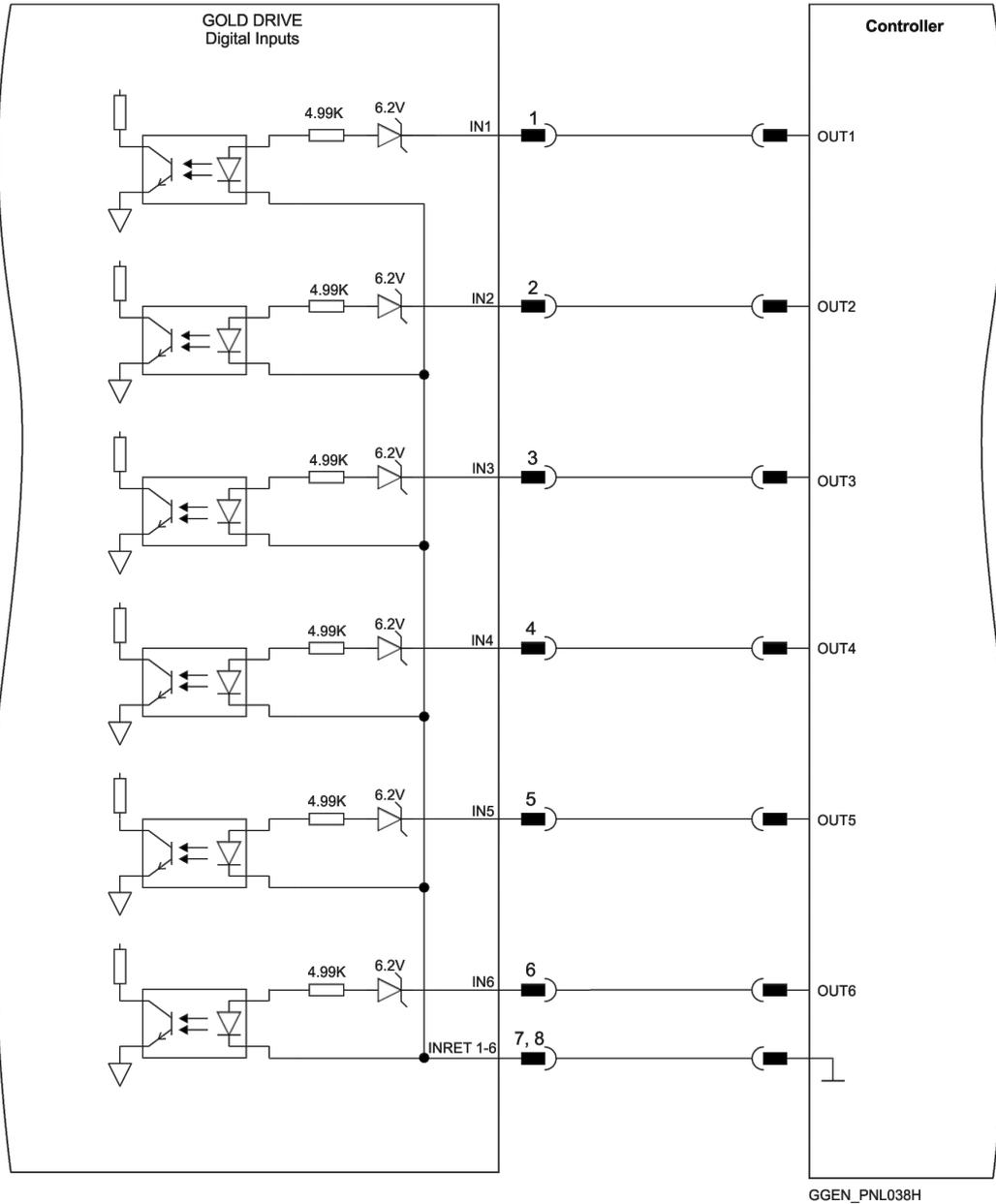


Figure 32: Digital Input Connection Diagram Example – Source PLC Option



### 8.4.1.2. Sink PLC Voltage Level Digital Input

Feature	Details
Type of input	Isolated PLC Sink
Input current	$I_{in} = (V_{in} - 7.4) / 4.99K\Omega$ $I_{in} = 920 \mu A @ V_{in} = 12 V$ $I_{in} = 4.5 mA @ V_{in} = 30 V$
High-level input voltage	$12 V < V_{in} < 30 V$
Low-level input voltage	$0 V < V_{in} < 7 V$
Minimum pulse width	$> 250 \mu sec$
Execution time (all inputs): the time from application of voltage on input until execution is complete	$0 < T < 250 \mu sec$
High-speed inputs – 1–6 minimum pulse width, in high-speed mode	$T > 5 \mu sec$ if the input functionality is set to latch/capture (index/strobe). <b>Notes:</b> <ul style="list-style-type: none"> <li>Home mode is high-speed mode and can be used for fast capture and precise homing.</li> <li>Highest speed is achieved when turning on optocouplers.</li> </ul>
Capture with differential input Port A, Port B Index	$T > 0.1 \mu sec$ if the differential input functionality is set to touch probe/capture (index/strobe).

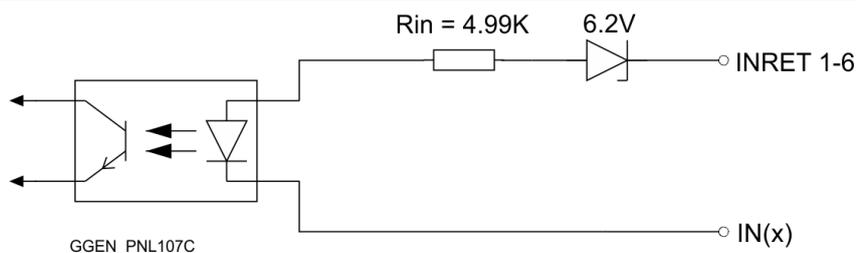


Figure 33: Digital Input Sink PLC Schematic

**NOTE:** In the default state, when there is no current in the optocoupler diode of GOLD SOLTWI OPTO, the digital input is "1". It is possible to change the default state by the IL[] command.

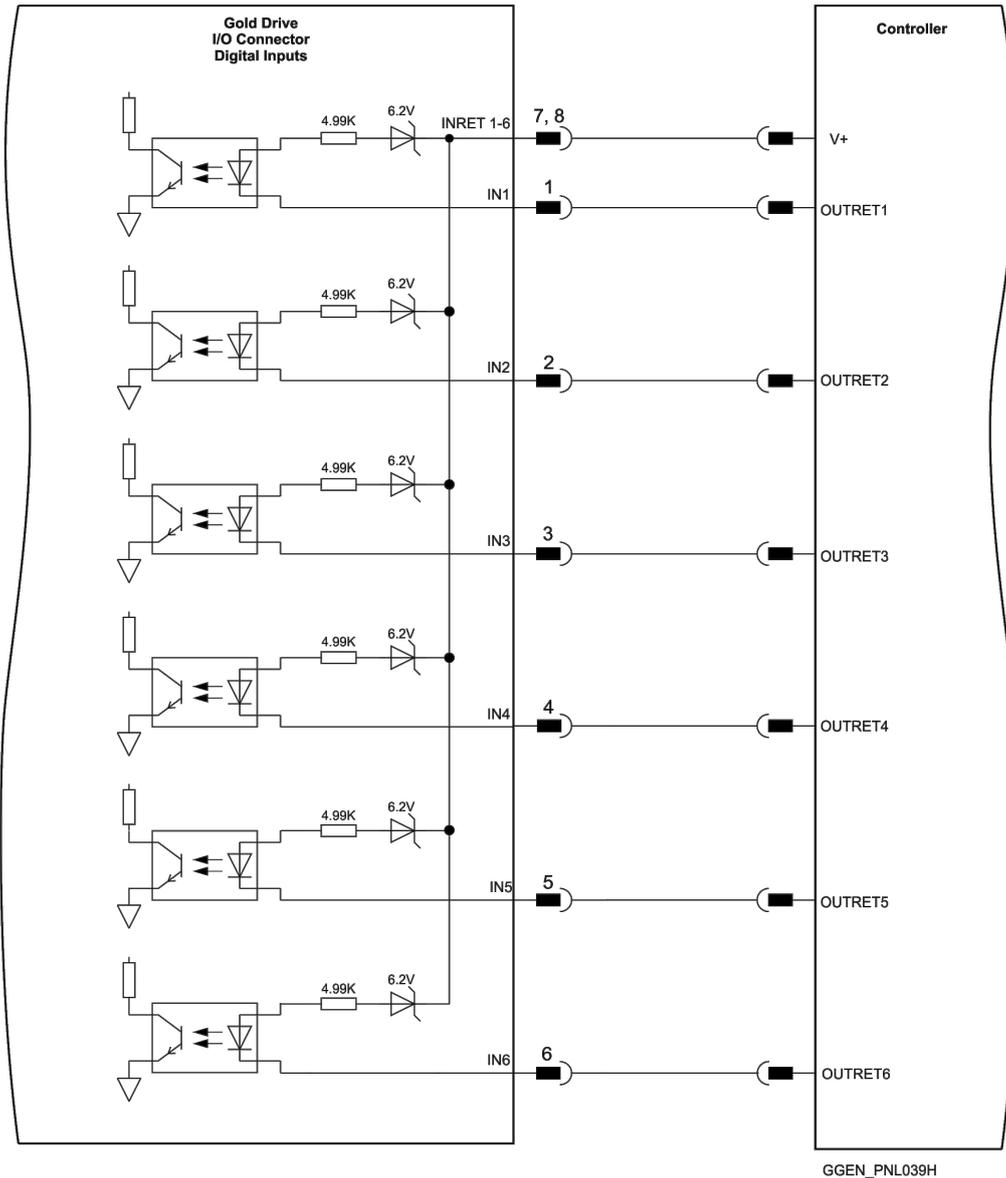


Figure 34: Digital Input Sink Mode Example – PLC voltage level Connection Diagram



### 8.4.1.3. Source 5V Logic Level Digital Input

Feature	Details
Type of input	Optically isolated
Input current for all inputs	$I_{in} = 3.8 \text{ mA @ } V_{in} = 5 \text{ V}$
High-level input voltage	$3.0 \text{ V} < V_{in} < 10 \text{ V}$ , 5 V typical
Low-level input voltage	$0 \text{ V} < V_{in} < 0.8 \text{ V}$
Minimum pulse width	$> 250 \mu\text{sec}$
Execution time (all inputs): the time from application of voltage on input until execution is complete	$0 < T < 250 \mu\text{sec}$
High-speed inputs – 1–6 minimum pulse width, in high-speed mode	<p><math>T &gt; 5 \mu\text{sec}</math> if the input functionality is set to latch/capture (index/strobe).</p> <p><b>Notes:</b></p> <p>Home mode is high-speed mode and can be used for fast capture and precise homing.</p> <p>Highest speed is achieved when turning on optocouplers.</p>

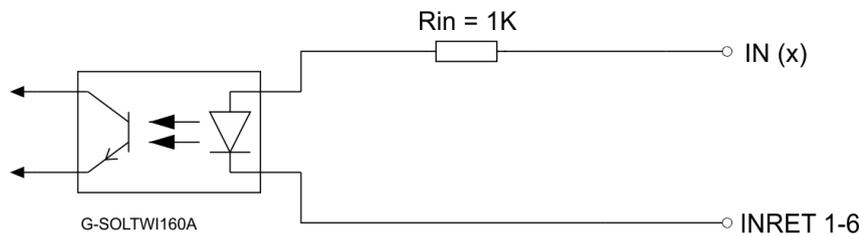


Figure 35: Digital Input 5V Logic Schematic

**NOTE:** In the default state, when there is no current in the optocoupler diode of GOLD SOLTWI OPTO, the digital input is "1". It is possible to change the default state by the IL[] command

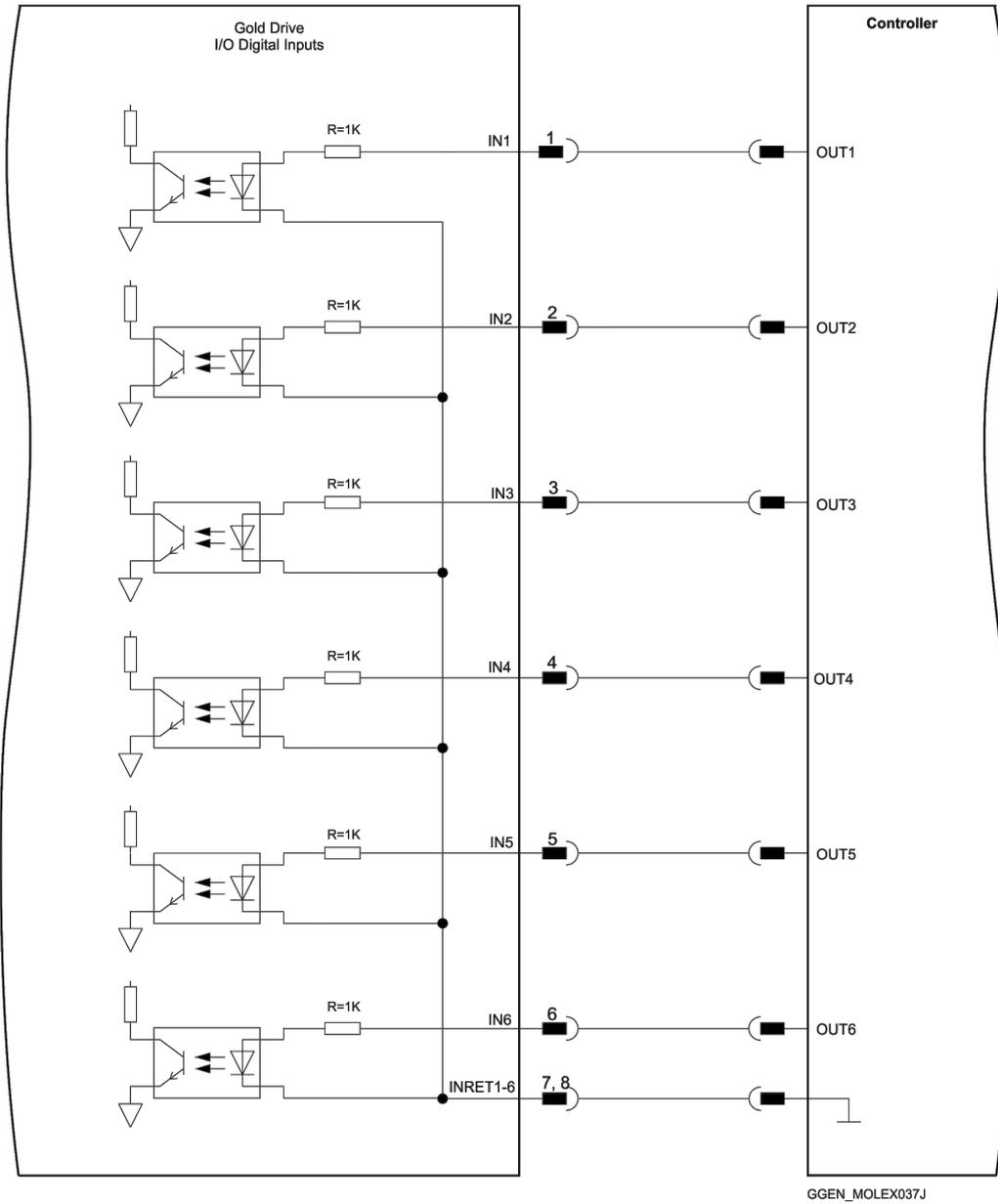


Figure 36: Digital Input Source 5V Logic Mode Connection Diagram



### 8.4.2. Digital Outputs

#### 8.4.2.1. Source PLC Voltage Level Digital Output

Feature	Details
Type of output	Optically isolated PLC source
Supply output (VDD)	12V to 30V (typically 24V)
Max. output current $I_{out (max)} (V_{out} = High)$	$I_{out (max)} \leq 30 \text{ mA}$
Collector Emitter saturation voltage	1V
$T_{on}$ (Time from low to high) If $V_{dd} = 24V$	< 15usec
$T_{off}$ (Time from high to Low)	< 250usec
$R_L$	The external $R_L$ must be selected to limit output current to no more than 30 mA.  $R_L = \frac{VDD - 1}{I_{out (max)}}$
Executable time	$0 < T < 250 \mu\text{sec}$

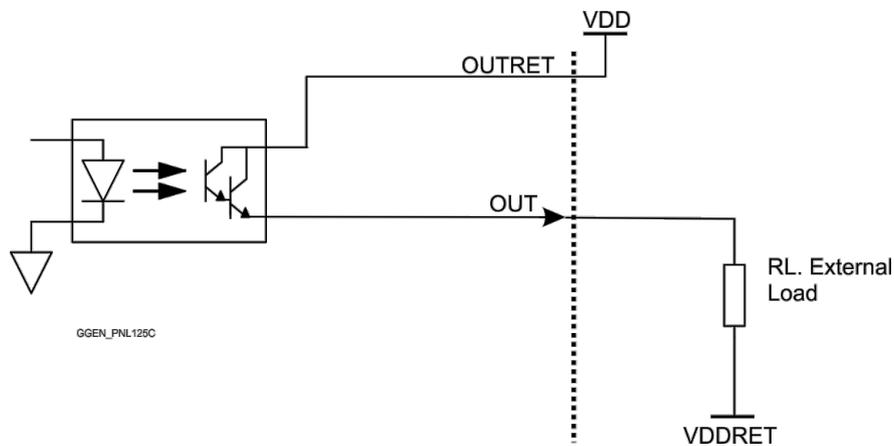


Figure 37: Digital Photodarlington Output Schematic – Source Mode PLC Level

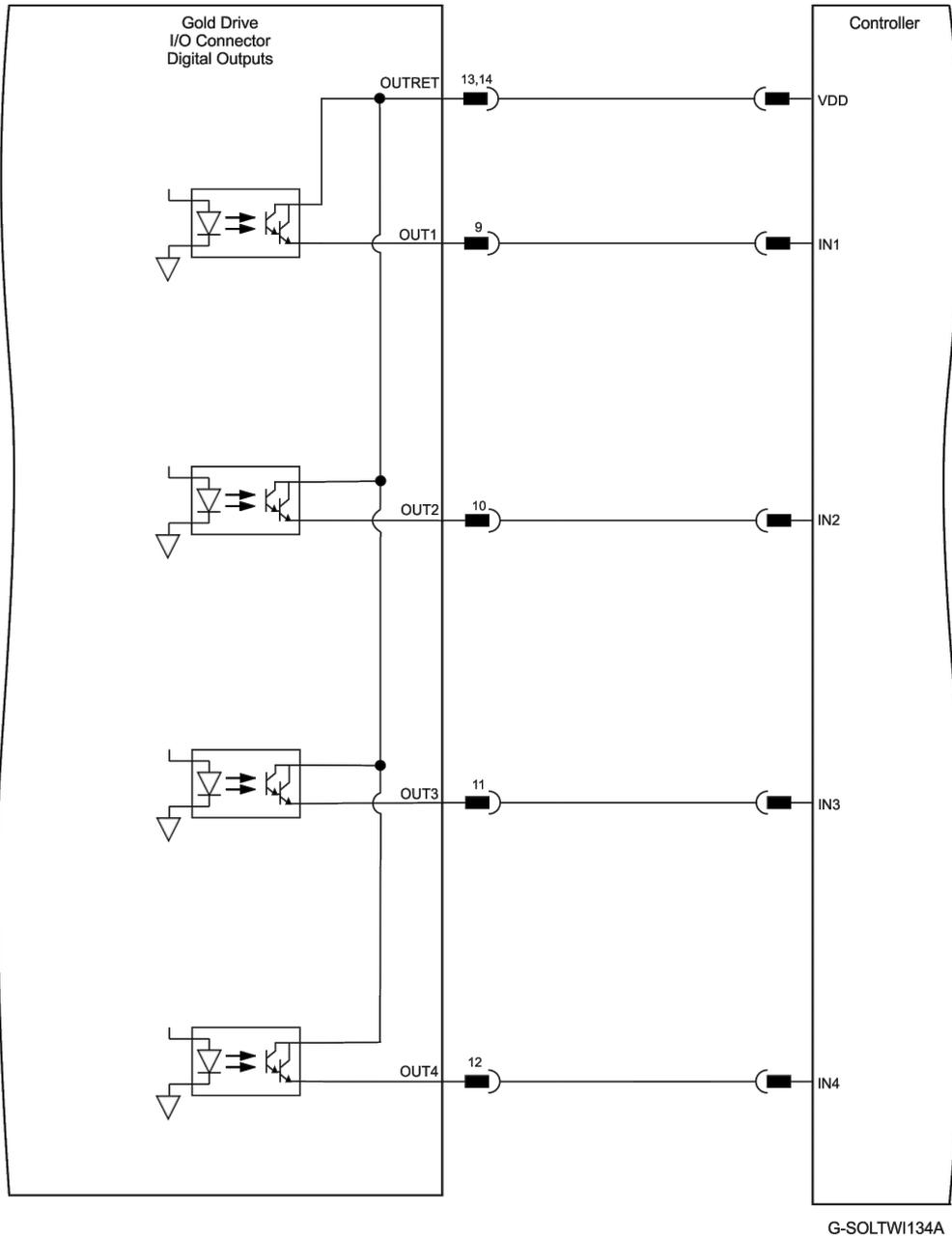


Figure 38: Digital Output Connection Diagram Example – Source PLC Option



### 8.4.2.2. Sink PLC Voltage Level Digital Output

Feature	Details
Type of output	Optically isolated PLC Sink
Supply output (VDD)	12V to 30V (Typically 24V)
Max. output current $I_{out} (max) (V_{out} = Low)$	$I_{out} (max) \leq 30 \text{ mA}$
Collector Emitter saturation voltage	1V
$T_{on}$ (Time from low to high) If $V_{dd} = 24V$	< 15usec
$T_{off}$ (Time from high to Low)	< 300usec
$R_L$	The external $R_L$ must be selected to limit output current to no more than 30 mA.  $R_L = \frac{VDD-1}{I_{out} (max)}$
Executable time	$0 < T < 250 \mu\text{sec}$

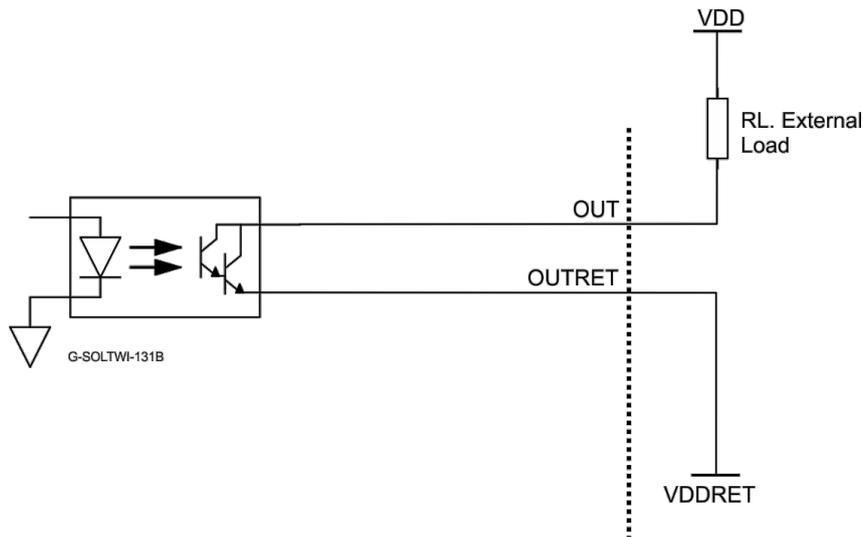


Figure 39: Digital Photodarlington Output Schematic for Sink – PLC level

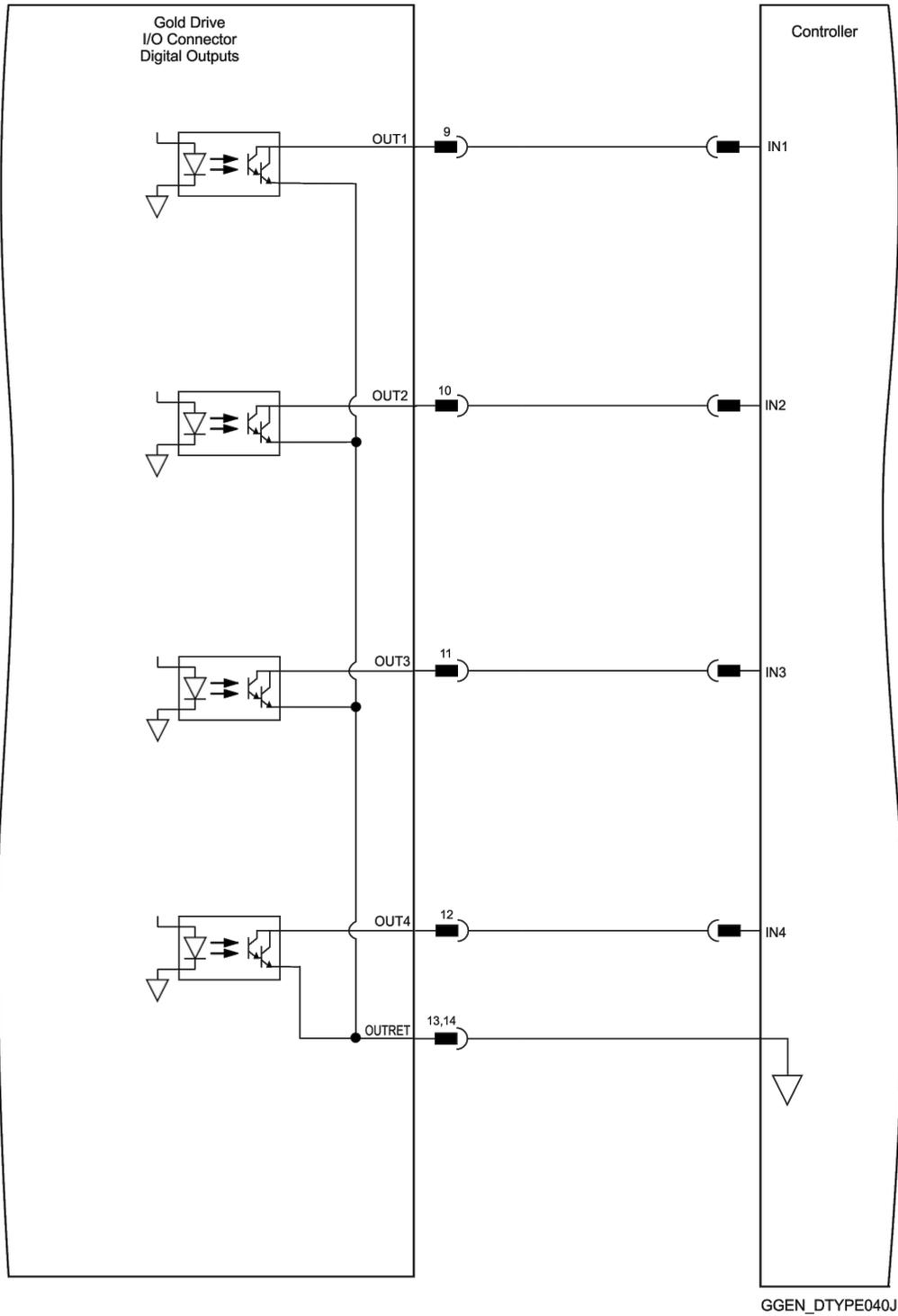
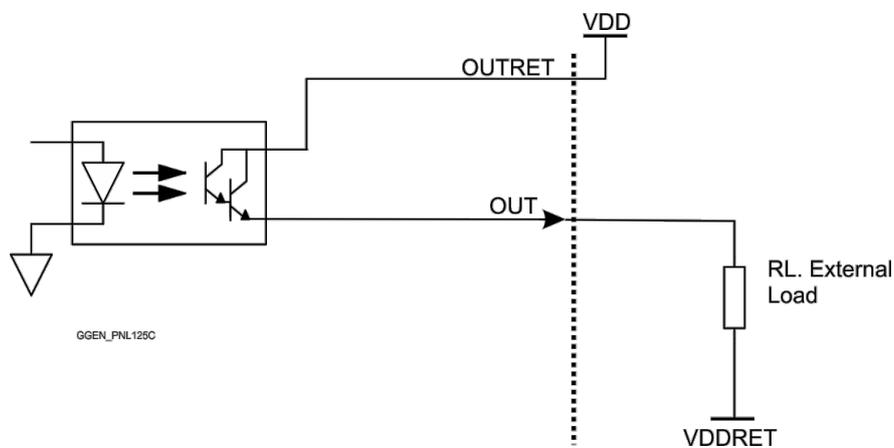


Figure 40: Digital Output Connection Diagram Example – Sink PLC Option

**8.4.2.3. Digital Outputs Source 5V Logic Mode**

Feature	Details
Type of output	Optically isolated 5V Logic source
Supply output (VDD)	< 30 V (Typically 5 V)
Max. output current $I_{out} (max) (V_{out} = High)$	$I_{out} (max) \leq 30 \text{ mA}$
Collector Emitter saturation voltage	1V
$T_{on}$ (Time from low to high) If $V_{dd} = 5V$	< 10usec
$T_{off}$ (Time from high to Low)	< 100usec
$R_L$	The external $R_L$ must be selected to limit output current to no more than 30 mA. $R_L = \frac{VDD-1}{I_{out} (max)}$
Executable time	$0 < T < 250 \mu\text{sec}$

**Figure 41: Digital Photodarlington Output Schematic – Source Mode 5V Logic Level**

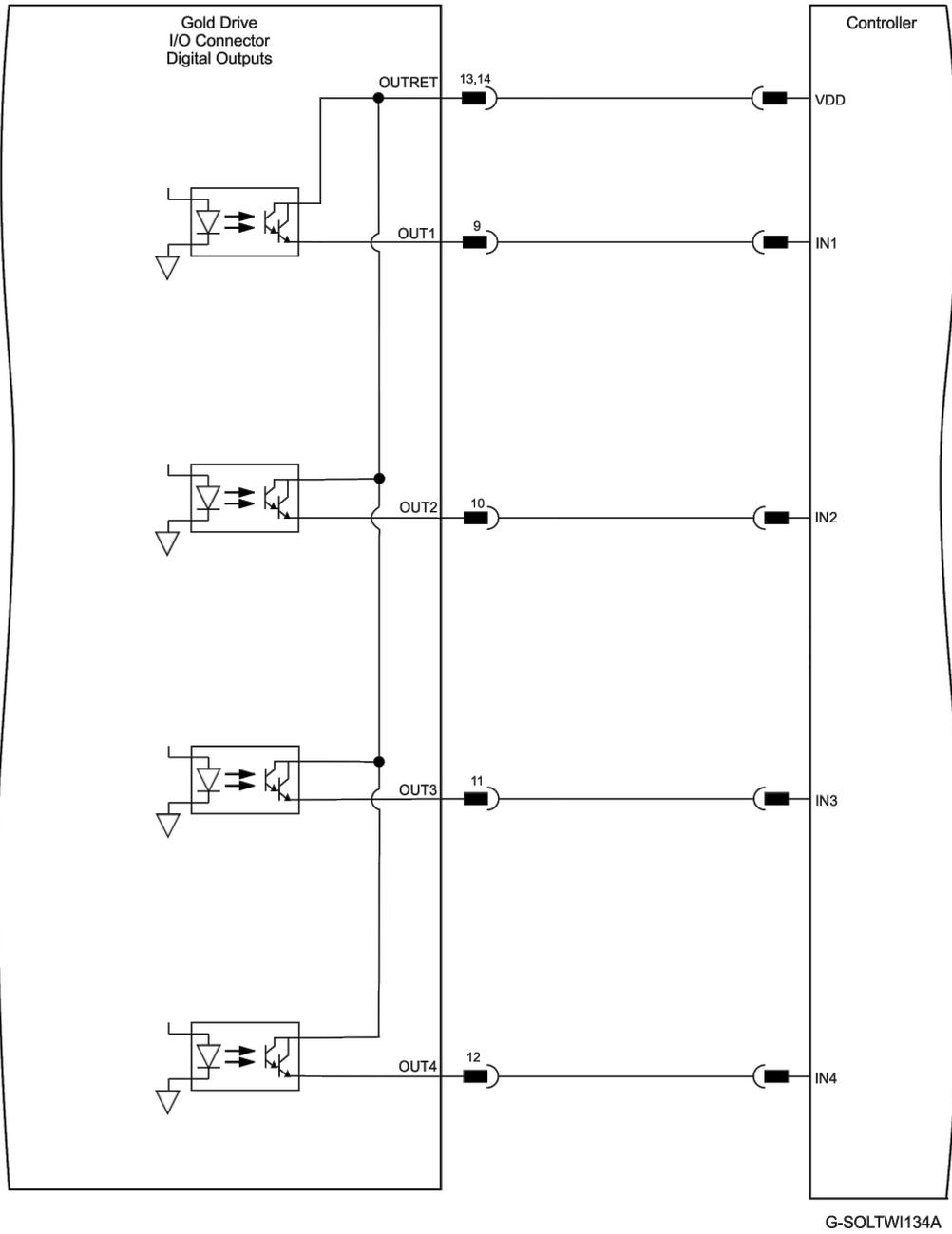


Figure 42: Digital Output Connection Diagram Example – Source 5V Logic Option



### 8.4.3. STO (Safe Torque Off)

For full details on STO, see Chapter 9 in the MAN-G-Board Level Modules Hardware manual.

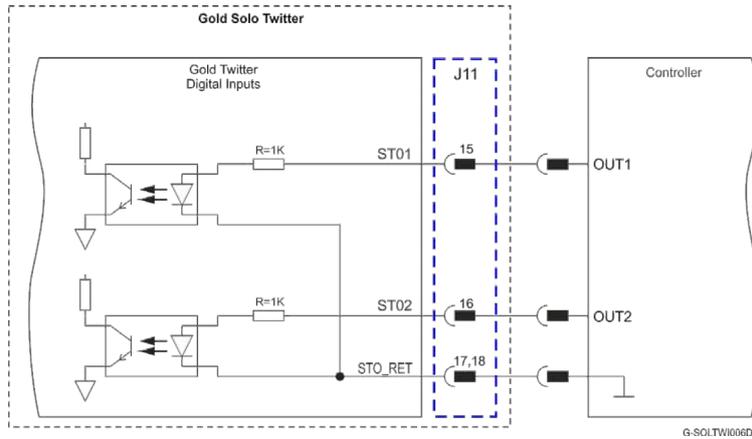


Figure 43: STO Input Connection – 5V Logic

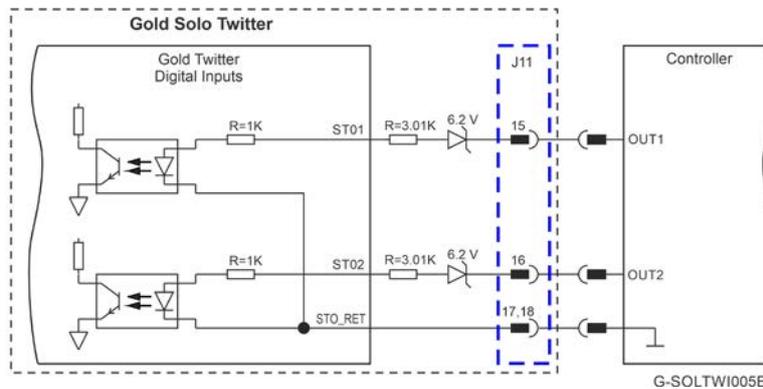


Figure 44: STO Input Connection – PLC (24V Logic)

### 8.4.4. Analog Input

For full details on Analog Inputs, see section 11.3 in the MAN-G-Board Level Modules Hardware manual.

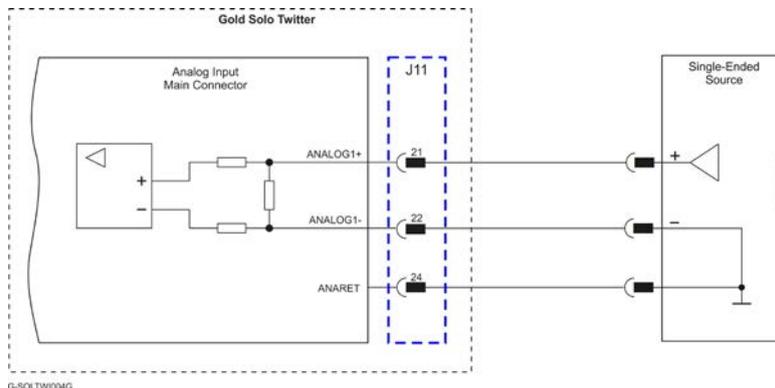


Figure 45: Analog Input

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.4.5. Standard RS-232

Figure 46 describes the Standard RS-232 connection diagram.

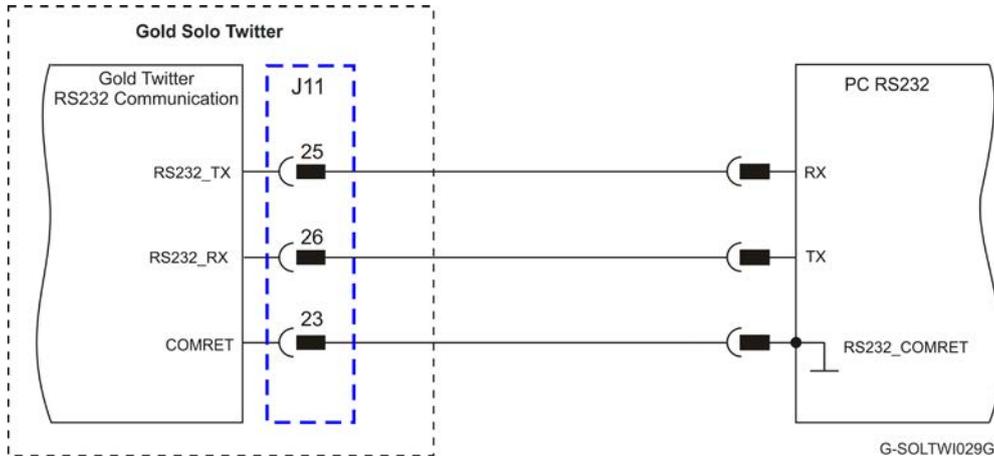


Figure 46: Standard RS-232 Connection Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.

### 8.4.6. USB 2.0 Communication (Only for EtherCAT version)

For full details on USB communication, see section 12.1 in the MAN-G-Board Level Modules Hardware manual.

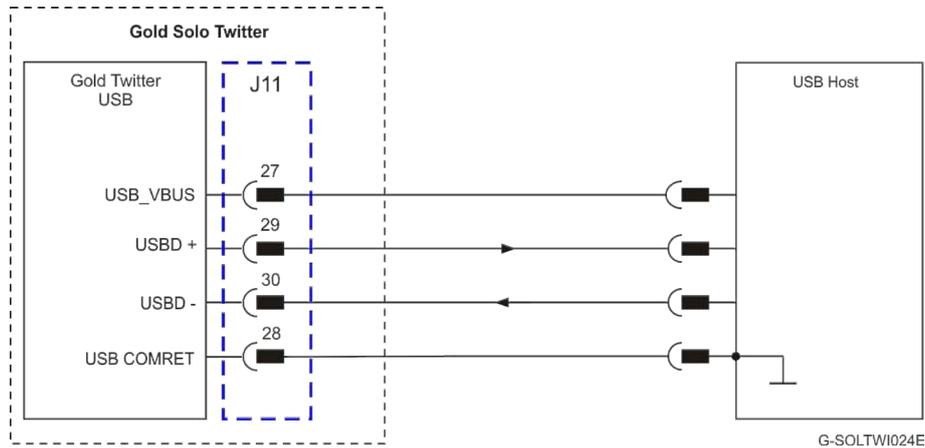
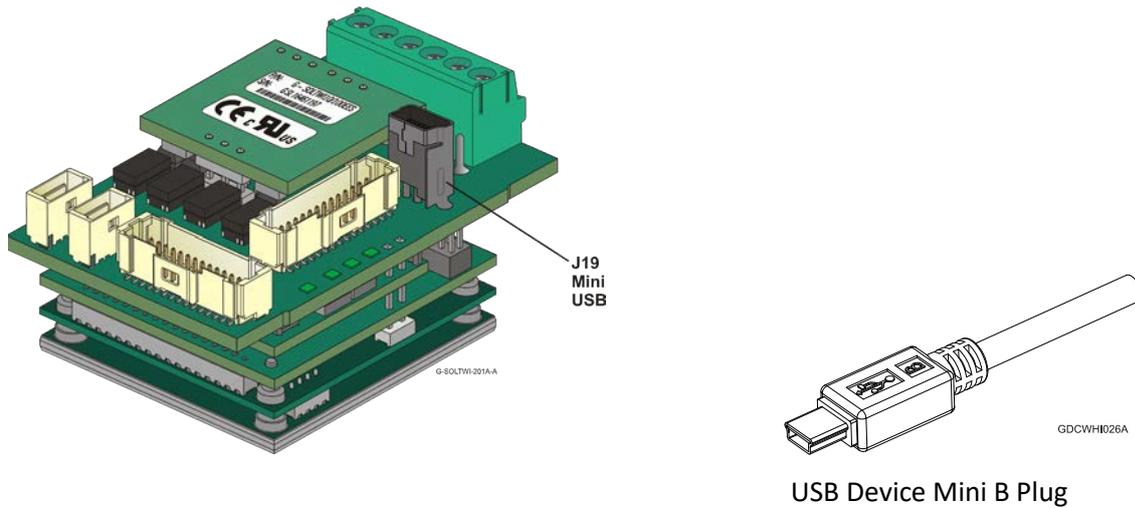


Figure 47: USB Network Diagram

For short distances between the drive and control, 0.5 to 1.0 m wires can be used and shielding is not required. For longer distances than 1.0 m and/or high EMI environment, shielded and twisted wires should be used. Drain wires should be connected to Elmo COMRET.



### 8.5. J19 Mini USB Communication Connector (Option M)



J19 Mini USB Communication Connector

**Note:** In the Mini USB model (Option M) the USB connection can be either from the mini USB connector or from the IO and Communication connector.  
**DO NOT** connect the USB communication from the mini USB and the IO and Communication connector simultaneously.

Pin J19	Signal	Function
1	USB VBUS	USB VBUS 5V
2	USBD-	USB _N line
3	USBD+	USB _P line
5	USB COMRET	USB communication return

Table 10: Mini USB Connector

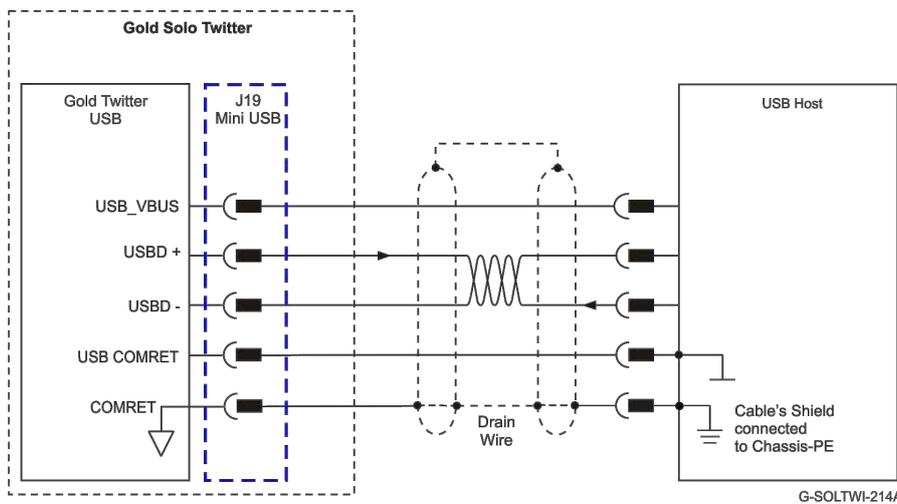


Figure 48: USB Network Diagram



### 8.6. EtherCAT Communications Version

Fieldbus communications are industrial network protocols for real-time distributed control that allows connection of servo drives. The Gold Solo Twitter supports the following EtherCAT fieldbus type industrial network protocol:

Fieldbus Type	Product Number
EtherCAT	G-SOLTWIXX/YYYE <b>XXX</b>
	G-SOLTWIXX/YYYM <b>XXX</b>

#### 8.6.1. EtherCAT IN/Ethernet Connector (J17)

Refer to section 12.2 in the MAN-G-Panel Mounted Drives Hardware manual for more details.

Pin (J17)	Signal	Function
1	EtherCAT_IN_TX+/Ethernet_TX+	EtherCAT in/Ethernet transmit +
2	EtherCAT_IN_TX-/Ethernet_TX-	EtherCAT in/Ethernet transmit -
3	EtherCAT_IN_RX+/Ethernet_RX+	EtherCAT in/Ethernet receive +
4	EtherCAT_IN_RX-/Ethernet_RX-	EtherCAT in/Ethernet receive -
5	COMRET	Shield drain wire

Pin Positions	Cable Connector
<p>J17 Pin Numbers</p> <p>G-SOLTWI_V5-018A-E</p>	<p>Ethernet Cable Connector</p>

Table 11: EtherCAT IN / Ethernet Pin Assignments

Note: Always use CAT5e cables.



### 8.6.2. EtherCAT OUT Connector (J18)

See Section 12.2 in the MAN-G-Panel Mounted Drives Hardware manual for the electrical diagram.

Pin (J18)	Signal	Function
1	EtherCAT_OUT_TX+	EtherCAT out transmit +
2	EtherCAT_OUT_TX-	EtherCAT out transmit -
3	EtherCAT_OUT_RX+	EtherCAT out receive +
4	EtherCAT_OUT_RX-	EtherCAT out receive -
5	COMRET	Shield drain wire

Pin Positions	Cable Connector
	<p><b>Ethernet Cable Connector</b></p>

Table 12: EtherCAT OUT Pin Assignments

Note: Always use CAT5e cables.



### 8.6.3. EtherCAT Schematic Connections

For full details on EtherCAT communication, see Section 12.2 in the in the MAN-G-Board Level Modules Hardware manual.

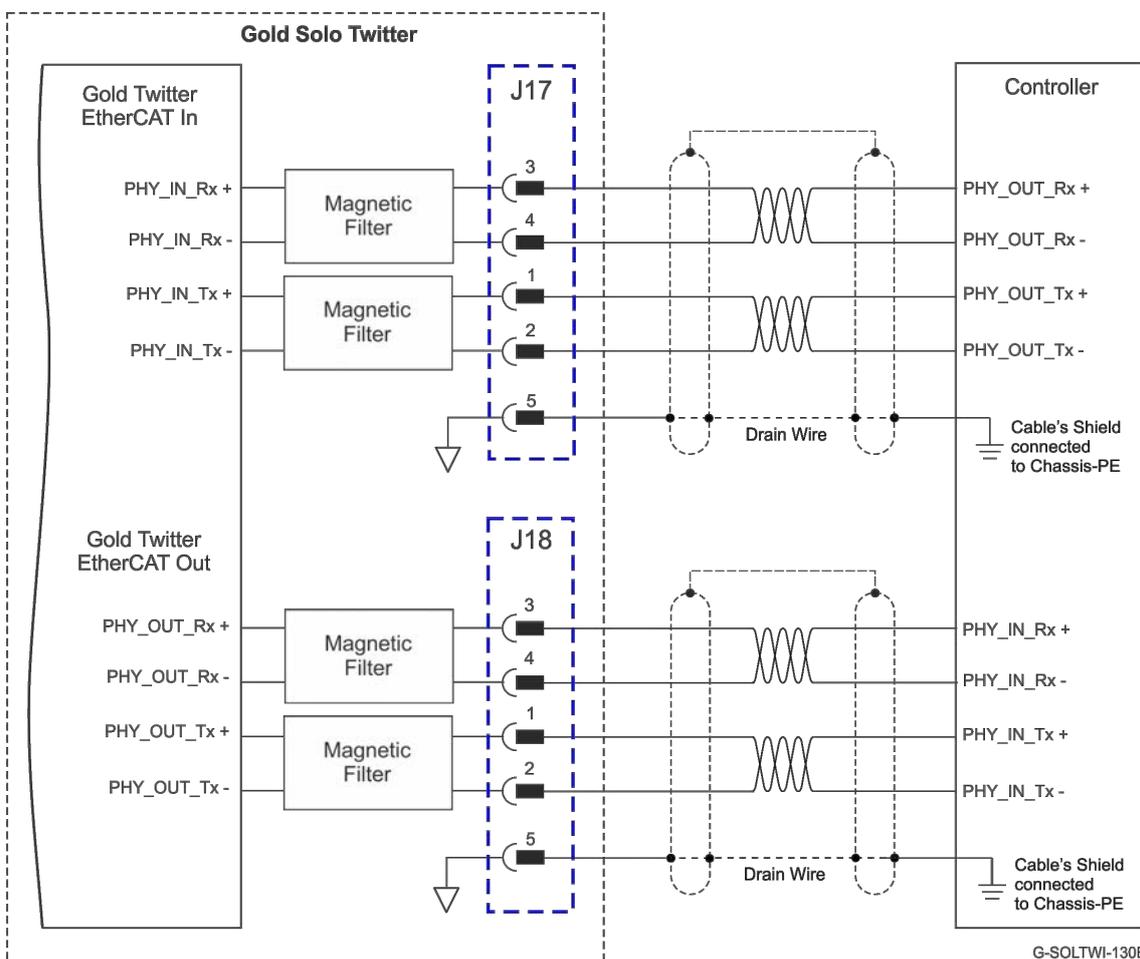
**Note:** The EtherCAT IN port can be configured to an Ethernet Port.

#### 8.6.3.1. EtherCAT Communication

This section only describes the EtherCAT communication, and the pinout drawing of the connector.



**When the EtherCAT is connected and the FoE is in operation, the USB cable connection must be disconnected.**



G-SOLTWI-130B

Figure 49: EtherCAT Connection Schematic Diagram

**Note:** Always use CAT5e cables.



### 8.6.3.2. EtherCAT Status Indicator (D2)

The EtherCAT status indicator D2 is a single red/green dual bi-colored LED that combines the green RUN indicator and the red ERROR indicator of the EtherCAT state machine. For further details, see the EtherCAT Application Manual.

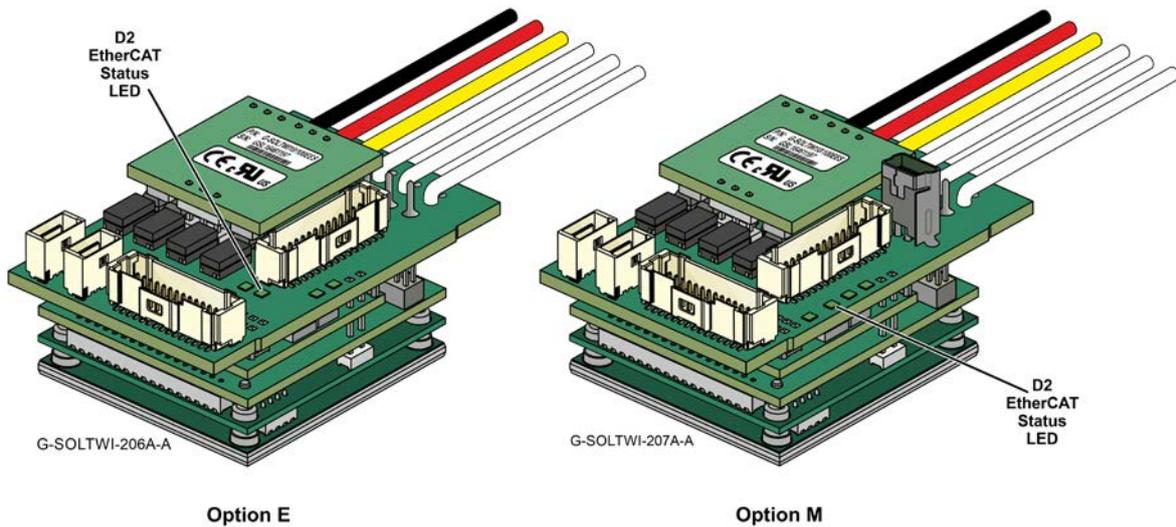


Figure 50: EtherCAT Status LED

### 8.6.3.3. EtherCAT Link Indicators (D3, D4)

The Gold Solo Twitter can serve as an EtherCAT slave device. For this purpose it has two Ports J17 and J18, which are designated as EtherCAT In and EtherCAT Out. Each of these Ports has a status LED; D3 EtherCAT In and D4 EtherCAT Out, which are shown in Figure 51.

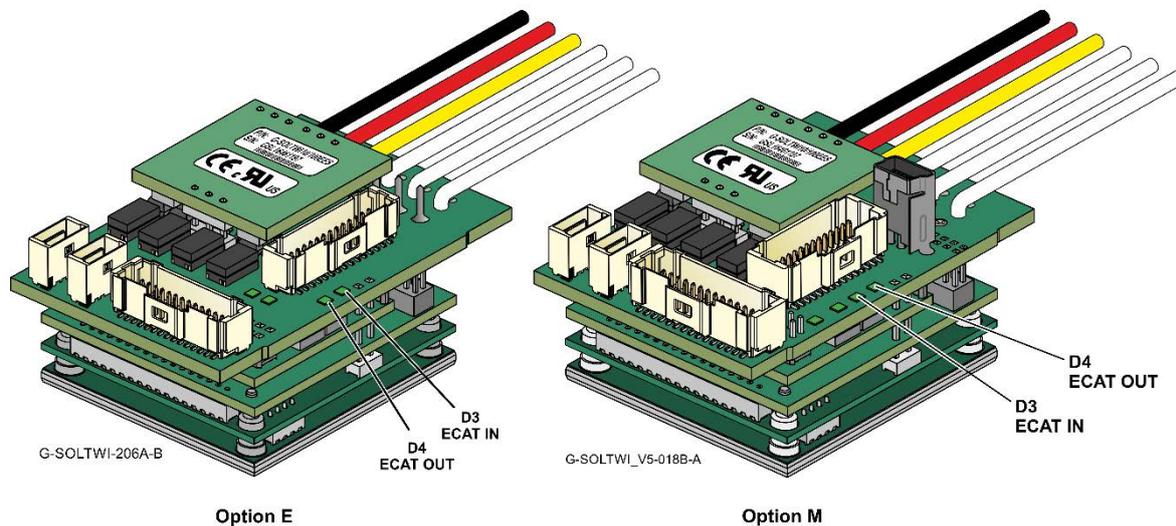


Figure 51: EtherCAT Link LEDs

The green LEDs D3 and D4 are the link/activity indicators. They show the state of the applicable physical link and the activity on that link; blinking green, D3 for the Link Act IN, and D4 for the Link Act OUT.



### 8.7. CAN Communications Version

Fieldbus communications are industrial network protocols for real-time distributed control that allows connection of servo drives. The Gold Solo Twitter supports the following CAN fieldbus type industrial network protocol:

Fieldbus Type	Product Number
CAN	G-SOLTWIXX/YYYSXXX

See Section 12.4 in the MAN-G-Panel Mounted Drives Hardware manual for the electrical diagram.

#### 8.7.1. CAN IN Connector (J17)

Pin (J17)	Signal	Function
1	NC	NC
2	CAN_RET	CAN Return
3	CAN_H	CAN_H bus line (dominant high)
4	CAN_L	CAN_L bus line (dominant low)
5	COMRET	Shield drain wire

Pin Positions	Cable Connector
	<p><b>CAN Cable Connector</b></p>

Table 13: CAN IN Connector Pin Assignments

**Note:** Always use CAT5e cables.



### 8.7.2. CAN OUT Connector (J18)

Pin (J18)	Signal	Function
1	NC	NC
2	CAN_RET	CAN Return
3	CAN_H	CAN_H bus line (dominant high)
4	CAN_L	CAN_L bus line (dominant low)
5	COMRET	Shield drain wire

Pin Positions	Cable Connector
	<p><b>CAN Cable Connector</b></p>

Table 14: CAN OUT Connectors Pin Assignments

Note: Always use CAT5e cables.



### 8.7.3. CAN Schematic Connections

For full details on CANopen communication, see section 14.3 in the MAN-G-Board Level Modules Hardware manual.

#### 8.7.3.1. Interface

The Gold Solo Twitter includes the CAN transceiver, common mode choke, and a CAN Bus Protector against ESD and other harmful transient voltage events.

The following signals describe how to connect CAN to the external connector.

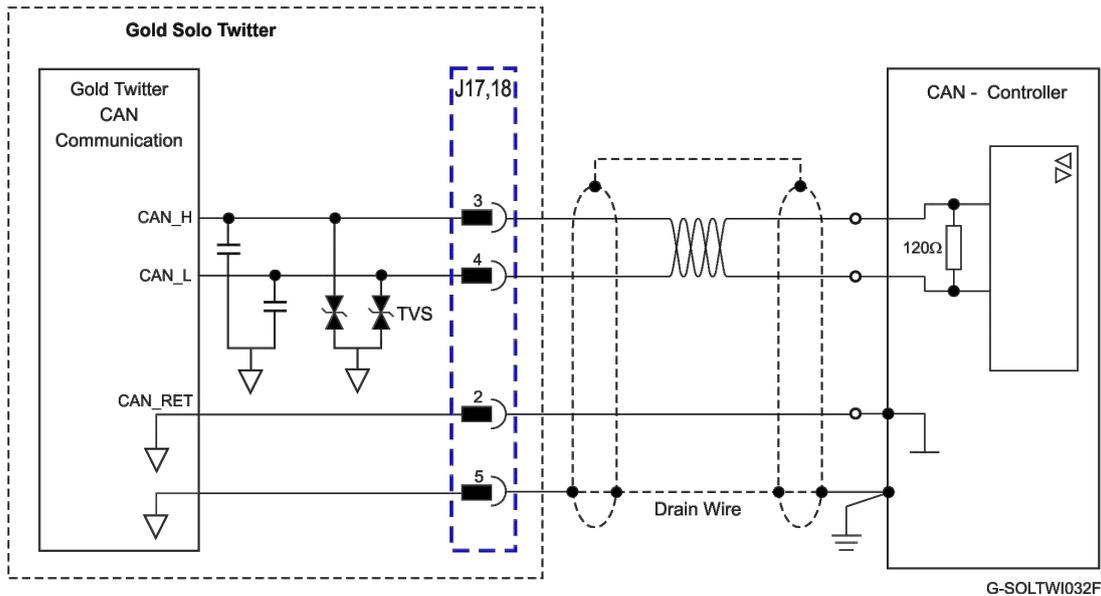


Figure 52: CAN Interface



### 8.7.3.2. CAN Network Topology

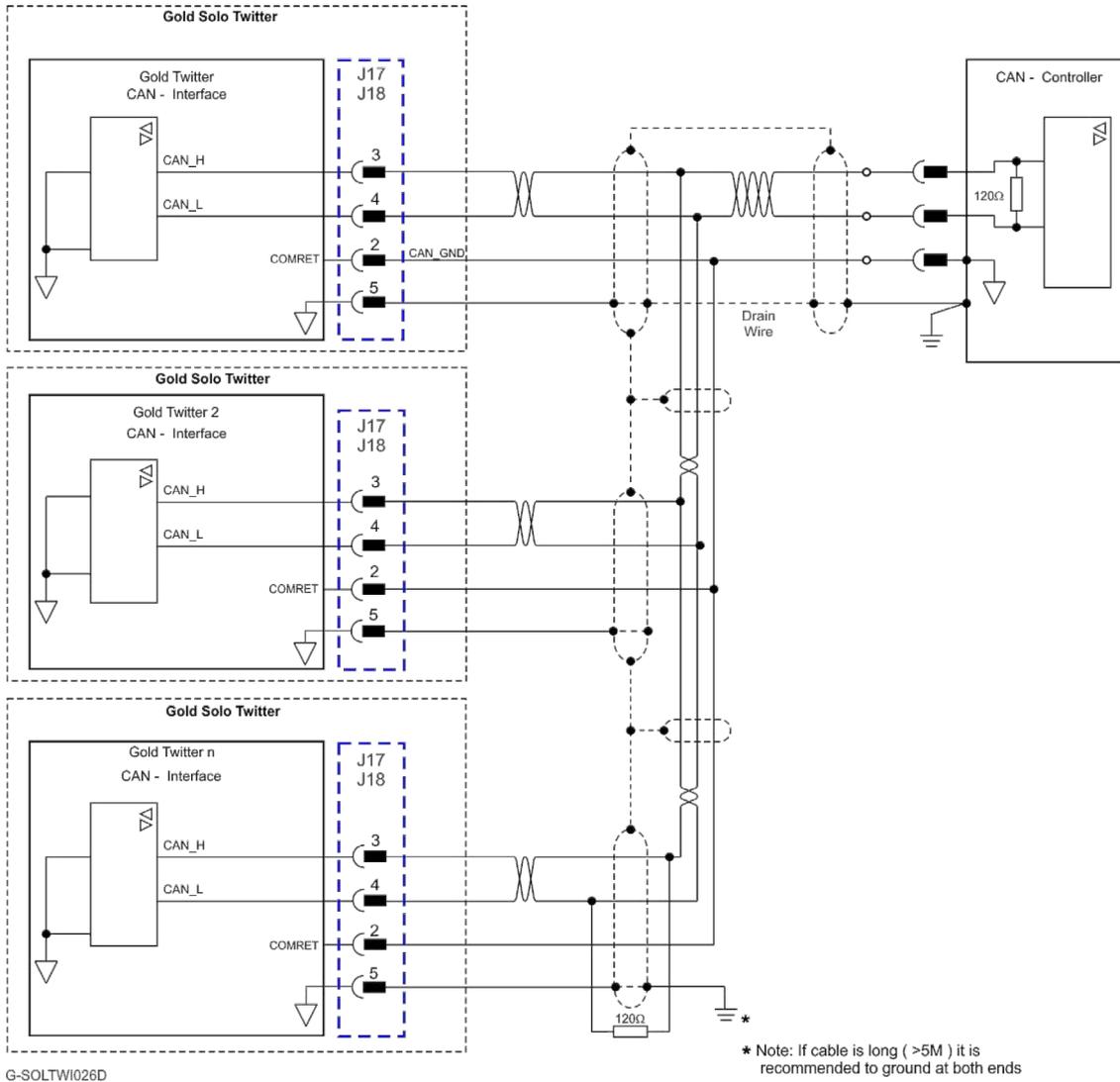


Figure 53: CAN Network Diagram – Drop Off Topology



**Caution:** When installing CAN communication, ensure that each servo drive is allocated a unique ID. Otherwise, the CAN network may “hang”.

**Note:** Daisy chain topology can also be accomplished using J18.

**Note:** Always use CAT5e cables.



## Chapter 9: Powering Up

After the Gold Solo Twitter is connected to its device, it is ready to be powered up.



### Caution:

Before applying power, ensure that the DC supply is within the specified range and that the proper plus-minus connections are in order.

### 9.1. Initializing the System

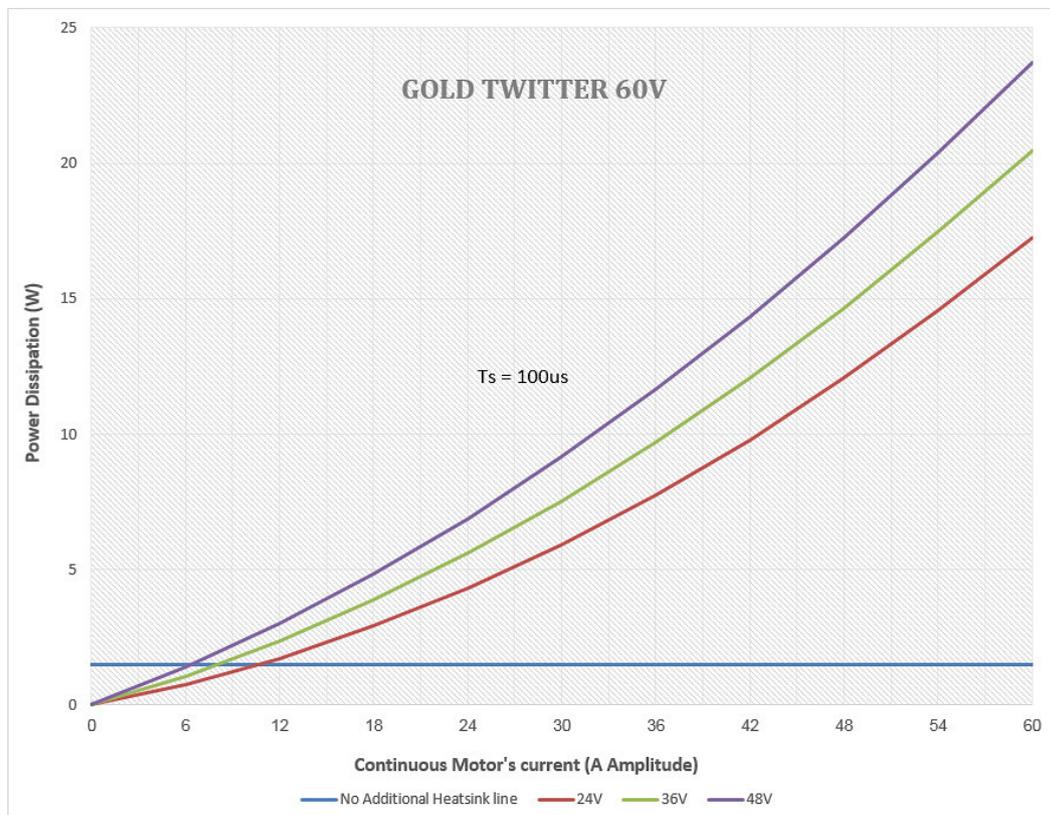
After the Gold Solo Twitter has been connected and mounted, the system must be set up and initialized. This is accomplished using the *EASII*, Elmo's Windows-based software application. Install the application and then perform setup and initialization according to the directions in the *EASII User Manual*.

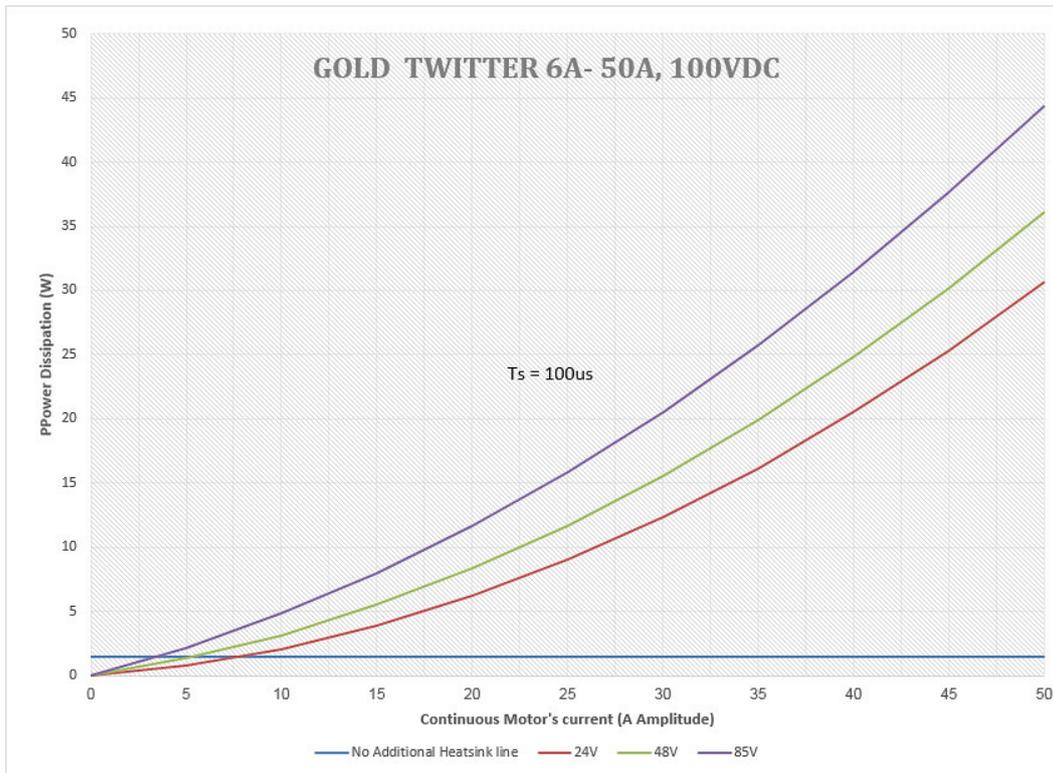
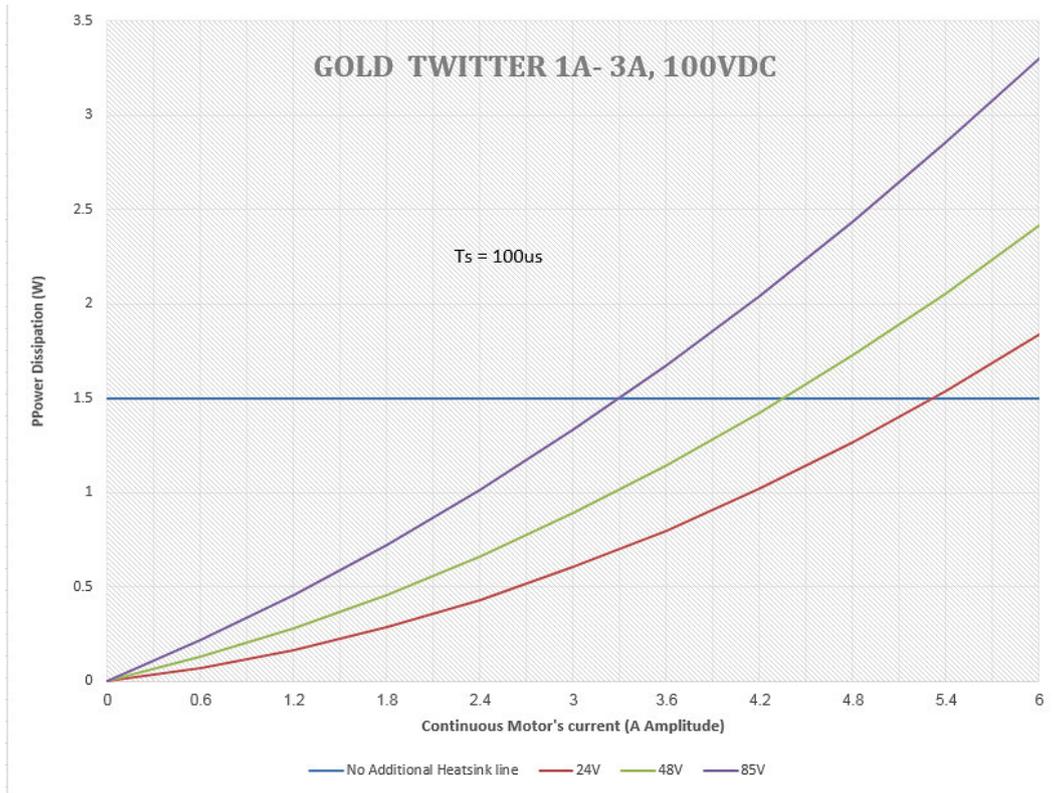
### 9.2. Heat Dissipation

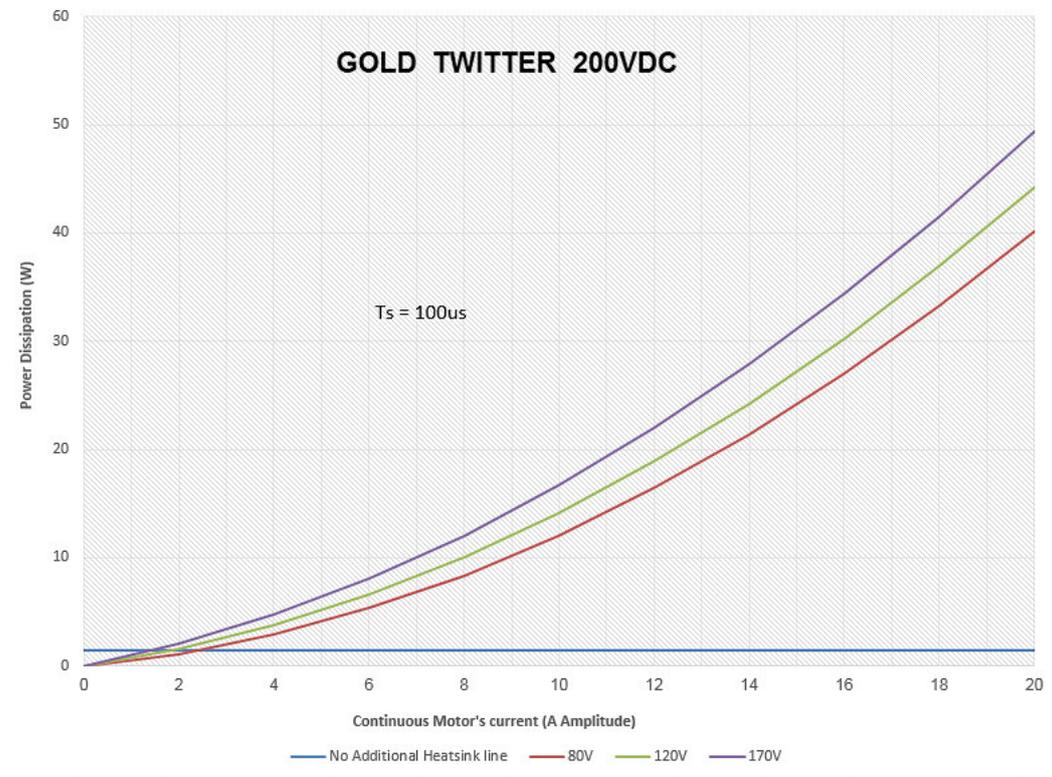
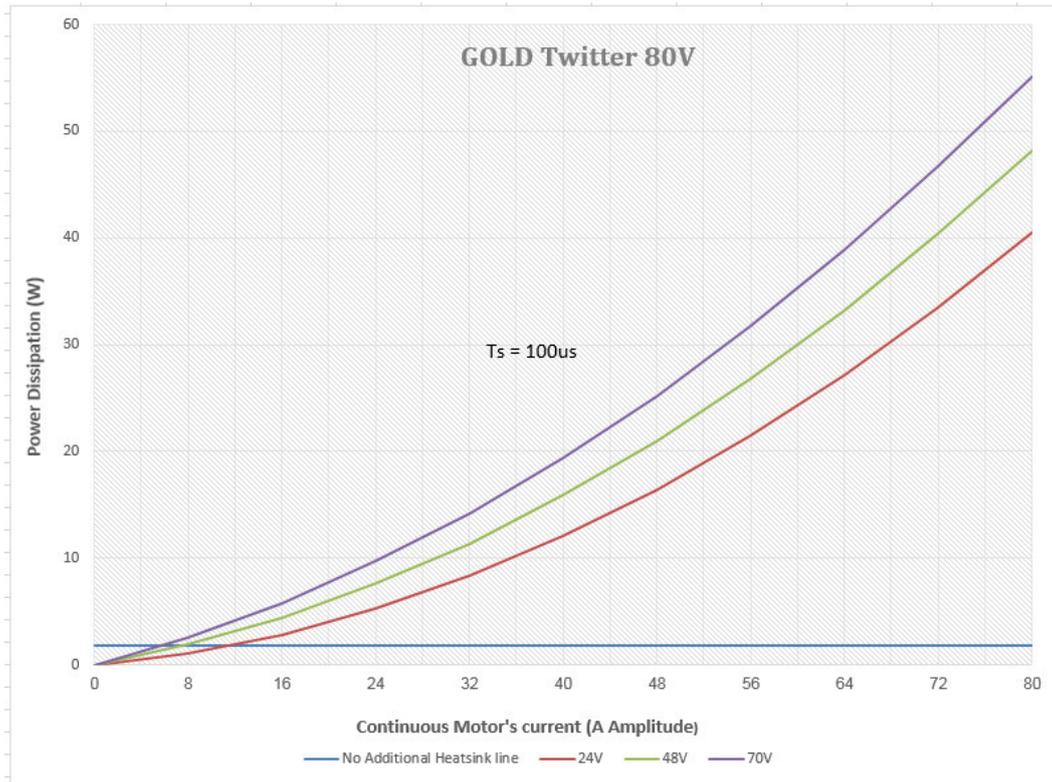
The best way to dissipate heat from the Gold Solo Twitter is to mount it so that its heat-sink is attached to the machine chassis. If mounted with its heat-sink suspended, then for best results mount the servo drive faced upwards and leave approximately 10 mm of space between the Gold Solo Twitter's heat-sink and any other assembly.

#### 9.2.1. Heat Dissipation Data

Heat Dissipation is shown graphically below. **It should be noted in the graphs below that the Flat Heat Sink and Fins Heat Sink can dissipate up to 5.5W and 7.0W respectively:**









## 9.2.2. How to Use the Chart

The charts above are based upon the theoretical worst-case scenario. The actual test results display a 20% -30% lower power dissipation.

The above charts indicate the net power conversion losses and exclude the control losses.

### To determine if your application heat dissipation requires a heat sink:

1. Determine the power dissipation according to the "continuous current" and the DC bus voltage curve.  
If the DC bus is not one of the three curves above, estimate the dissipation by interpolation. The estimation error is not critical.
2. The chart is calculated for continuous current operation, if the actual operation is pulsed current, add 25% to 30% to the power dissipation of the average (RMS) current.
3. When the Heat-Sink temperature reaches  $\approx 85^{\circ}\text{C}$ , the Gold Solo Twitter will shut down. Design the system for continuous operation so that the maximum Heat Sink temperature should be no higher than between  $80^{\circ}\text{C}$  to  $82^{\circ}\text{C}$ .
4. **For models Power Supply & Heatsink Option: (Blank) or S**  
If the average heat dissipation is less than  $\approx 1.5\text{W}$  (Average operating power of 100W to 200W) there will be no requirement for an external heat sink.  
If the average Heat dissipation is higher than 1.5W then an additional heat dissipation means is required, usually by connecting to an external heat-sink.  
**For model Power Supply & Heatsink Option: H**  
If the average heat dissipation is less than  $\approx 4\text{W}$  to  $5\text{W}$  (Average operating power of 300W to 600W) there will be no requirement for an additional external heat sink.  
If the average Heat dissipation is higher than 4W then an additional heat dissipation means is required, usually by connecting to an additional external heat-sink.
5. When an external Heat-Sink is required, calculate the thermal resistance of the heat sink according to:

$$\theta_{\text{C/W}} = \frac{80^{\circ}\text{C} - T_{\text{Ambient}}}{\text{Heat Dissipation}}$$



## Chapter 10: Dimensions, Physical Specifications

This chapter provides detailed technical dimensions regarding the Gold Solo Twitter.

### 10.1. EtherCAT Option E without Heatsink

#### 10.1.1. Wires To Power Supply G-SOLTWIRXX/YYEE1SQ

Dimensions (mm (in))	Weight g/oz
47.2 x 30.0 x 22.8 mm (1.85" x 1.18" x 0.9")	60.5 (2.13)

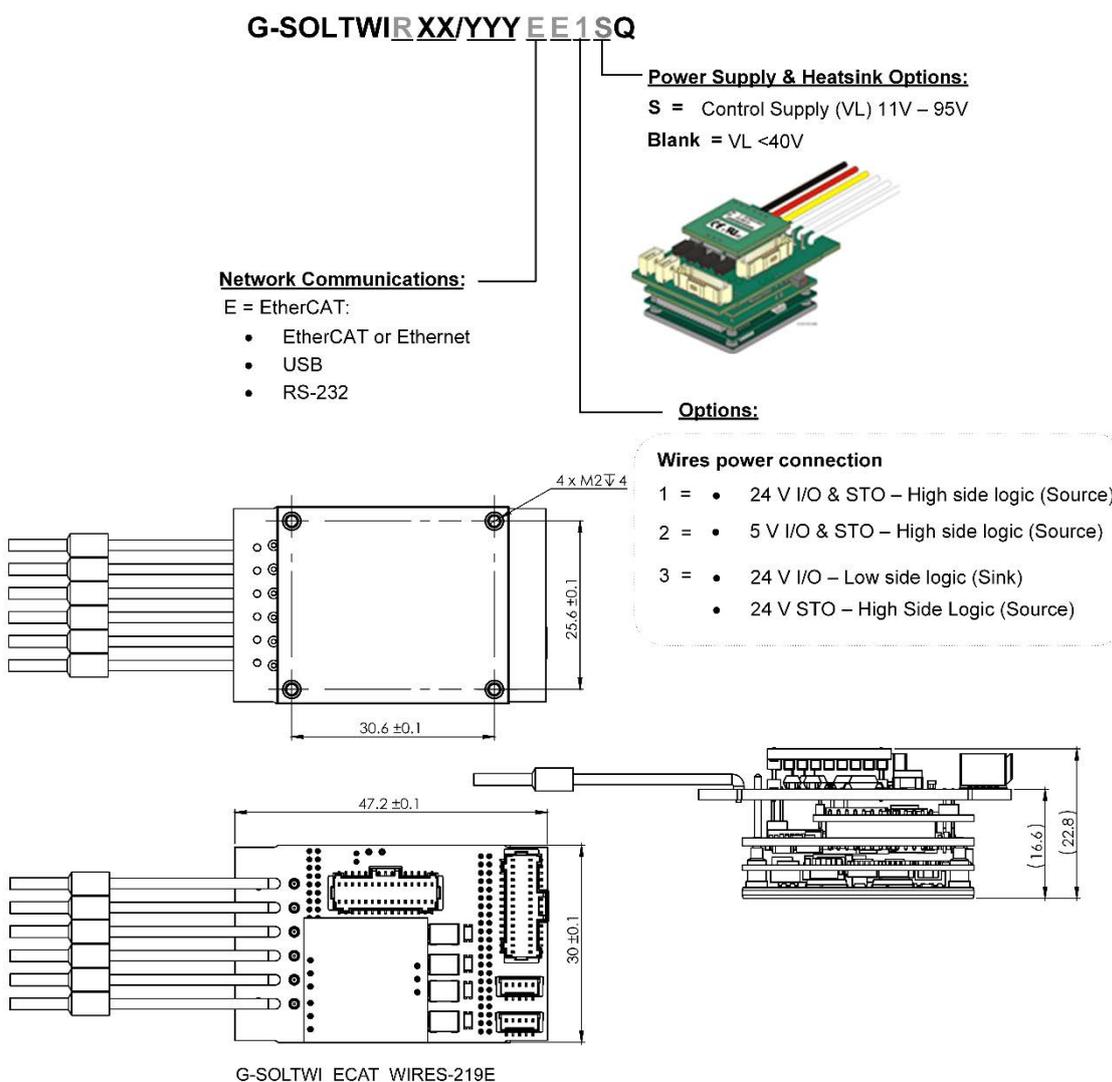


Figure 54: G-Solo Twitter –EtherCAT version (Option E) with wires to power supply and motor



### 10.1.2. Horizontal Power Connector G-SOLTWIRXX/YYEE1SQ

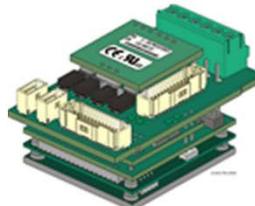
Dimensions (mm (in))	Weight g/oz
48.1 x 30.0 x 25.8 mm (1.89" x 1.18" x 1.02")	36.5 (1.29)

#### G-SOLTWIRXX/YYEE1SQ

**Power Supply & Heatsink Options:**

S = Control Supply (VL) 11V – 95V

Blank = VL <40V



**Network Communications:**

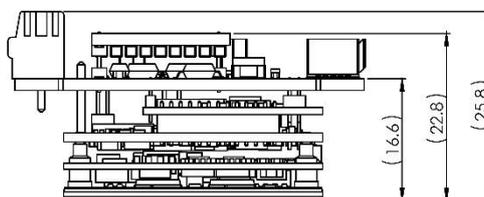
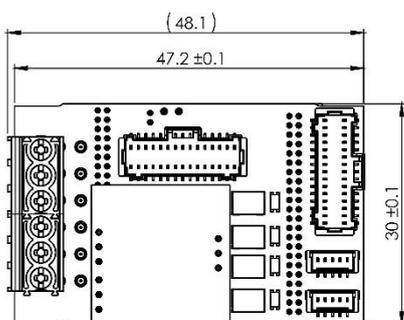
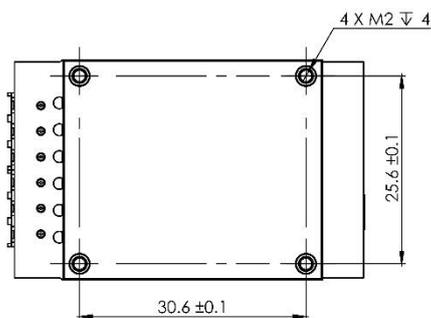
E = EtherCAT:

- EtherCAT or Ethernet
- USB
- RS-232

**Options:**

Horizontally positioned power connector for drives rated current XX ≤ 25A

- 7 = • 24 V I/O & STO – High side logic (Source)
- 8 = • 5 V I/O & STO – High side logic (Source)
- 9 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



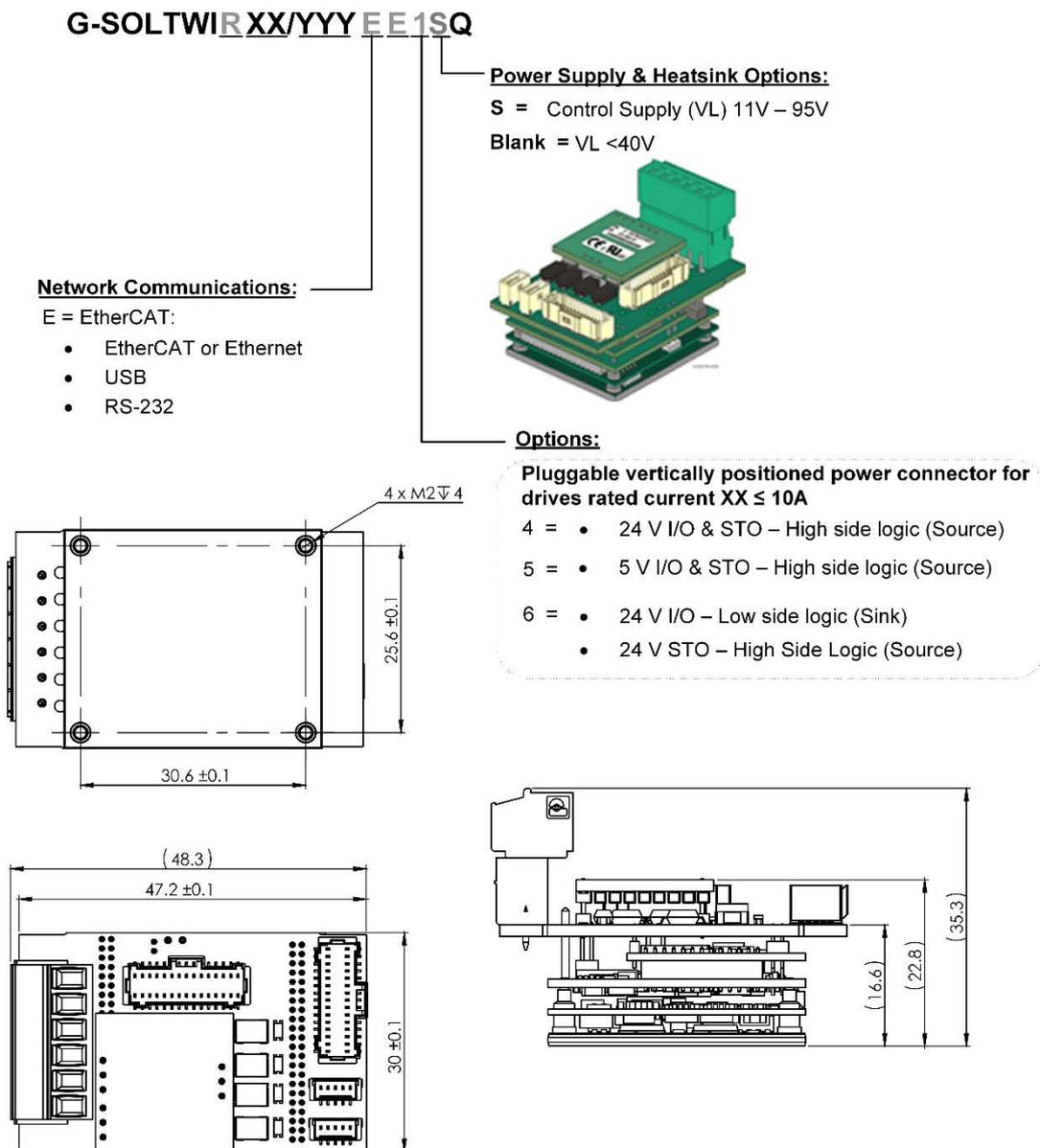
G-SOLTWI\_ECATH\_CONN-216E

Figure 55: G-Solo Twitter –EtherCAT version (Option E) with horizontal power connector



### 10.1.3. Vertical Power Connector G-SOLTWIRXX/YYEE1SQ

Dimensions (mm (in))	Weight g/oz
48.3 x 30 x 35.3 mm (1.90" x 1.18" x 1.39")	39.0 (1.38)



G-SOLTWI\_ECATCH\_V-CONN-2180E

Figure 56: G-Solo Twitter –EtherCAT version (Option E) with vertical power connector



## 10.2. EtherCAT Option E with Heatsink

### 10.2.1. Wires to Power Supply G-SOLTWIRXX/YYEE1HQ

Dimensions (mm (in))	Weight g/oz
47.6 x 41.3 x 26.8 mm (1.87" x 1.63" x 1.06")	81.5 (2.88)

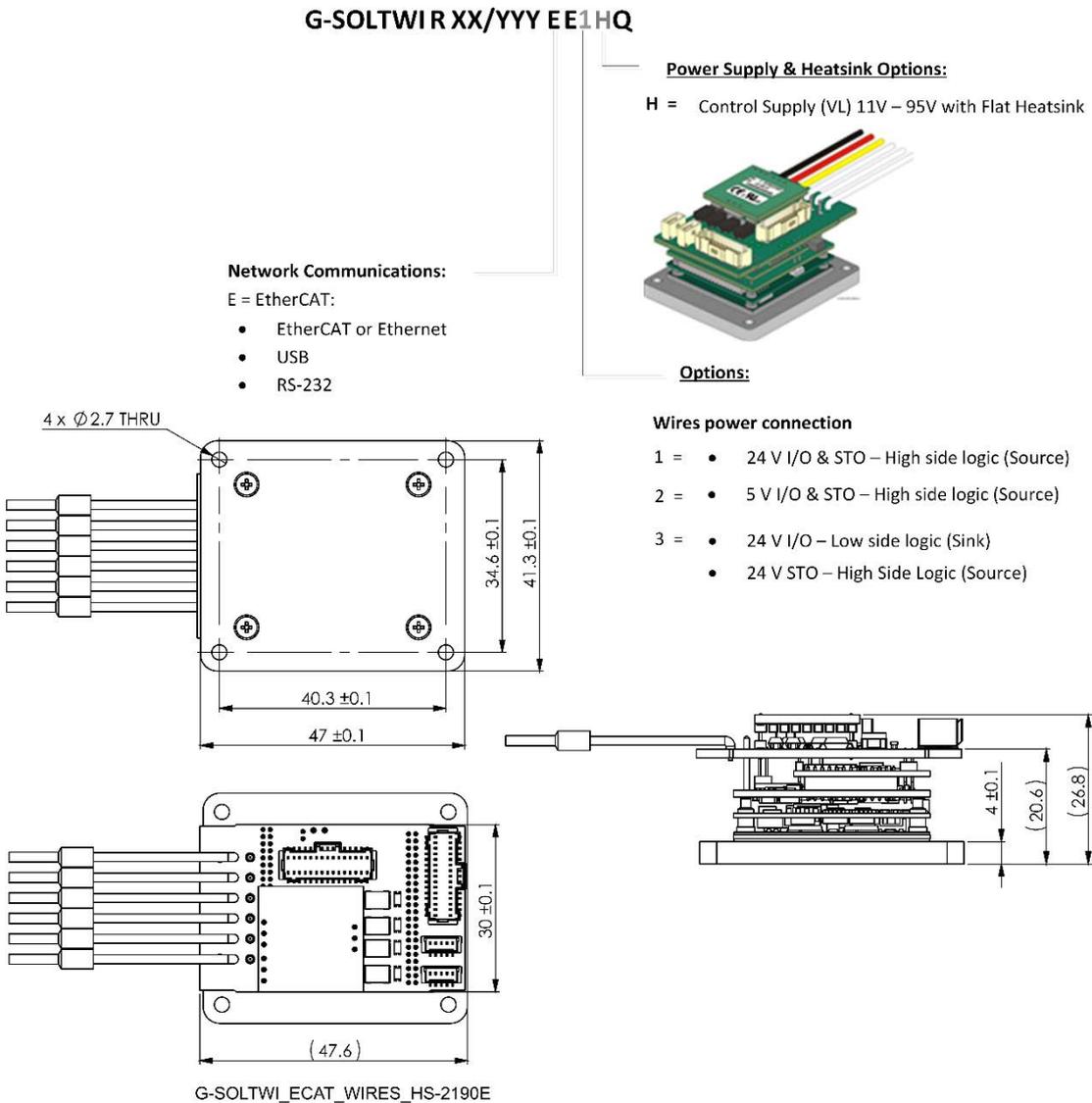


Figure 57: G-Solo Twitter –EtherCAT version with wires to power supply and motor



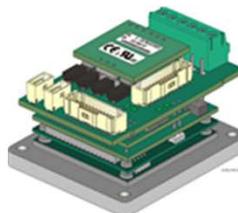
### 10.2.2. Horizontal Power Connector G-SOLTWIRXX/YYYEE1HQ

Dimensions (mm (in))	Weight g/oz
48.5 x 41.3 x 29.8 mm (1.91" x 1.63" x 1.17")	57.5 (2.03)

#### G-SOLTWIRXX/YYYEE1HQ

##### Power Supply & Heatsink Options:

H = Control Supply (VL) 11V – 95V with Flat Heatsink



##### Network Communications:

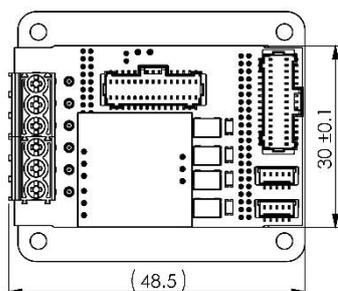
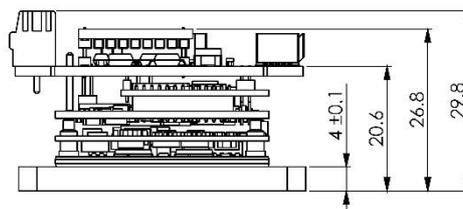
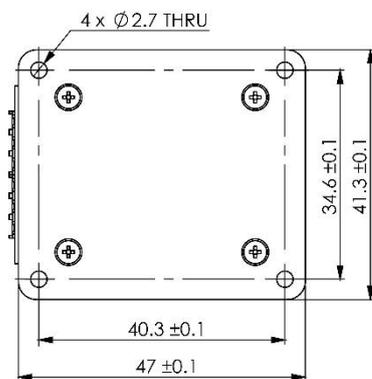
E = EtherCAT:

- EtherCAT or Ethernet
- USB
- RS-232

##### Options:

Horizontally positioned power connector for drives rated current XX ≤ 25A

- 7 = • 24 V I/O & STO – High side logic (Source)
- 8 = • 5 V I/O & STO – High side logic (Source)
- 9 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_ECATCHCONN\_HS-2216E

Figure 58: G-Solo Twitter –EtherCAT version with horizontal power connector



### 10.2.3. Vertical Power Connector G-SOLTWIRXX/YYEE1HQ

Dimensions (mm (in))	Weight g/oz
48.7 x 41.3 x 39.3 mm (1.92" x 1.63" x 1.55")	60.0 (2.12)

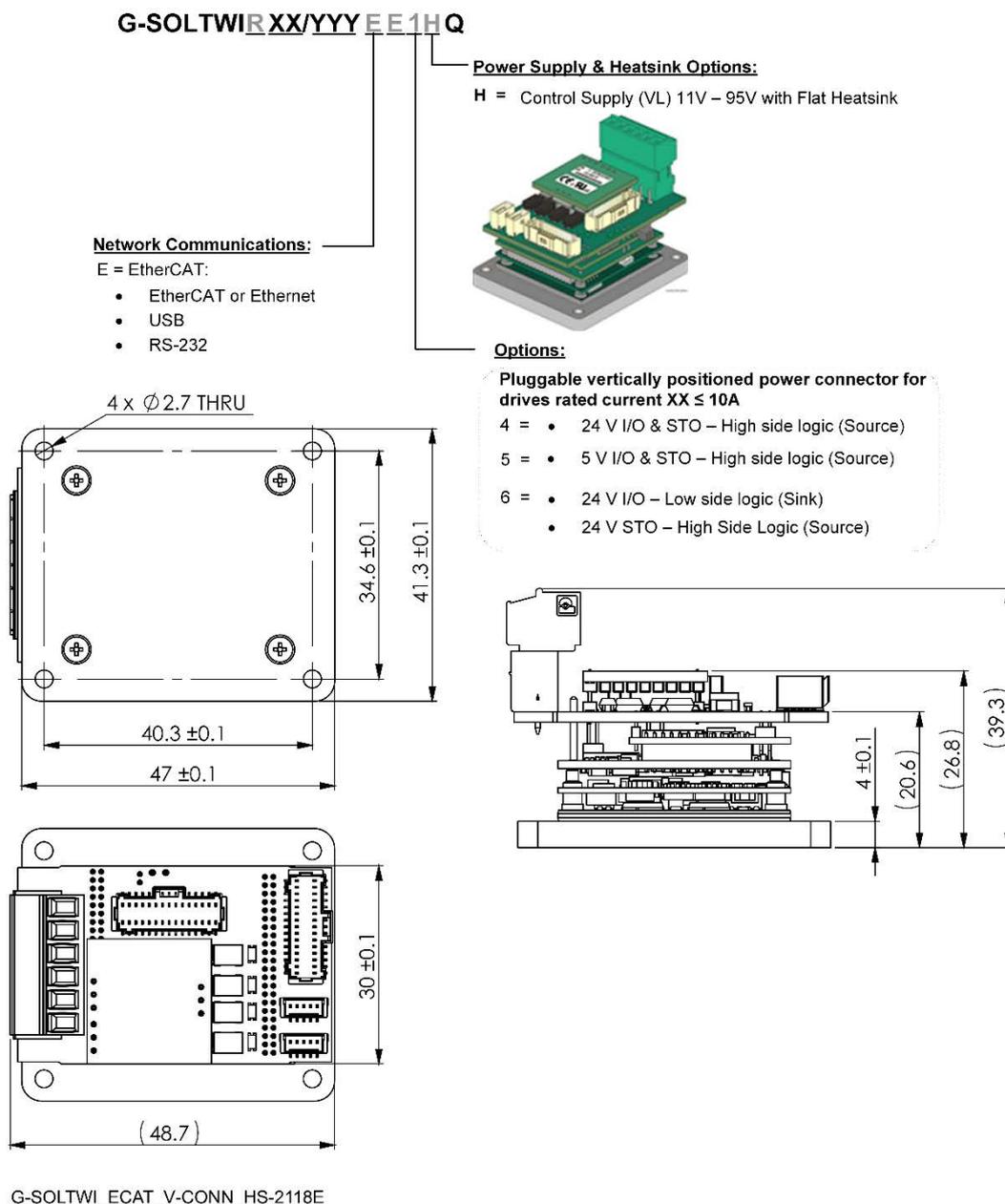
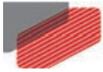


Figure 59: G-Solo Twitter –EtherCAT version with vertical power connector



### 10.3. EtherCAT Option M without Heatsink

#### 10.3.1. Wires to Power Supply G-SOLTWIRXX/YYME1SQ

Dimensions (mm (in))	Weight g/oz
47.2 x 31.2 x 25.8 mm (1.86" x 1.23" x1.02")	60.5 (2.13)

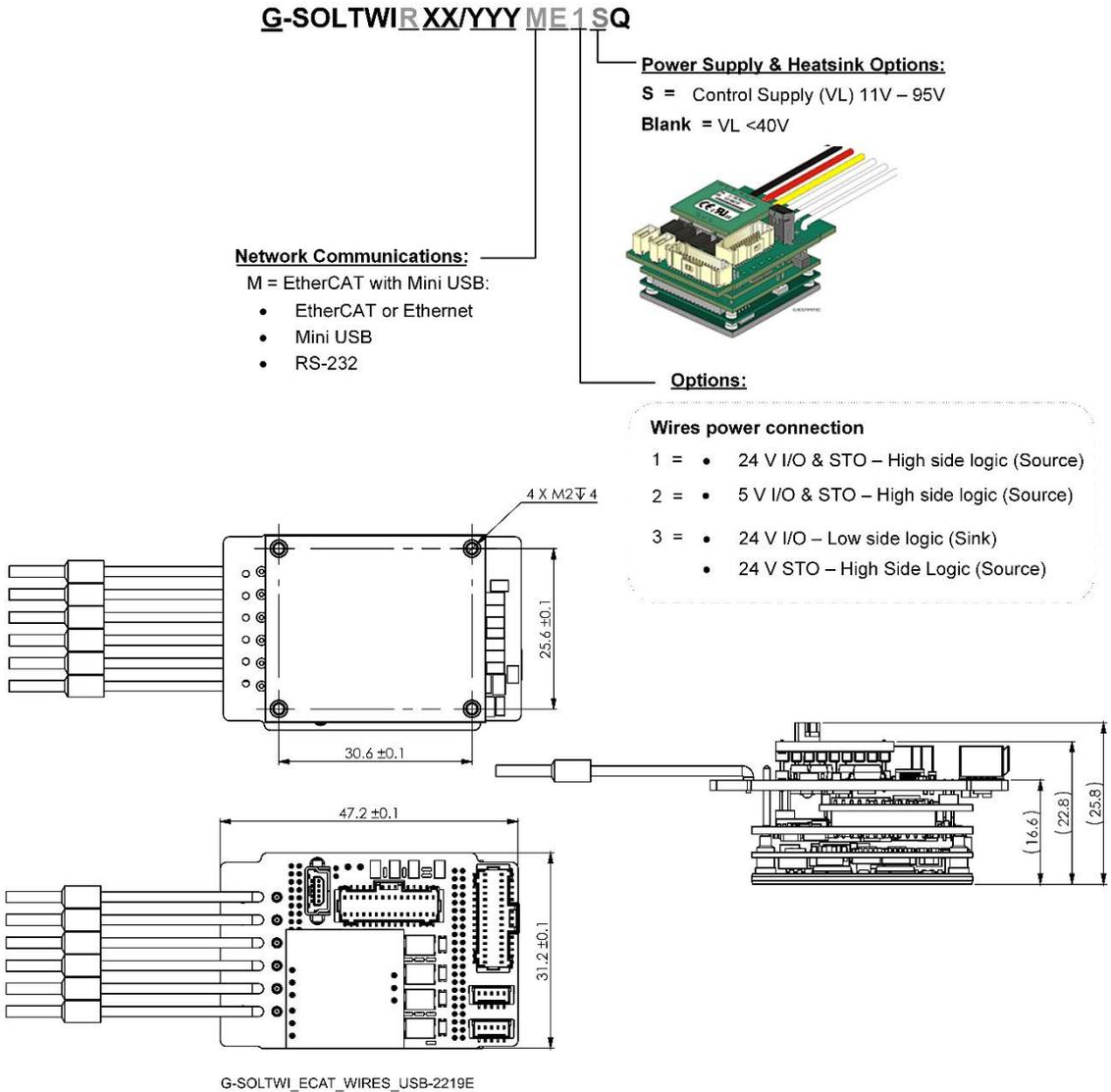


Figure 60: G-Solo Twitter –EtherCAT version (Option M) with wires to power supply and motor



### 10.3.2. Horizontal Power Connector G-SOLTWIRXX/YYYYME1SQ

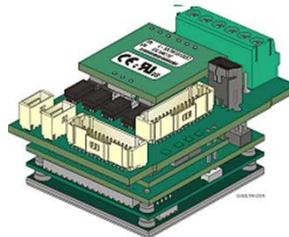
Dimensions (mm (in))	Weight g/oz
48.1 x 31.2 x 25.8 mm (1.89" x 1.23" x 1.02")	36.5 (1.29)

#### G-SOLTWIRXX/YYYYME1SQ

**Power Supply & Heatsink Options:**

S = Control Supply (VL) 11V – 95V

Blank = VL <40V



**Network Communications:**

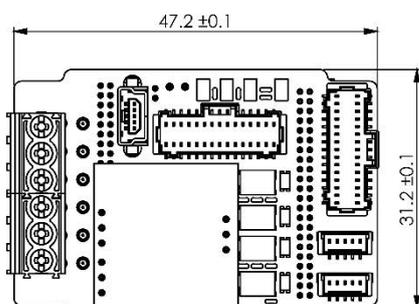
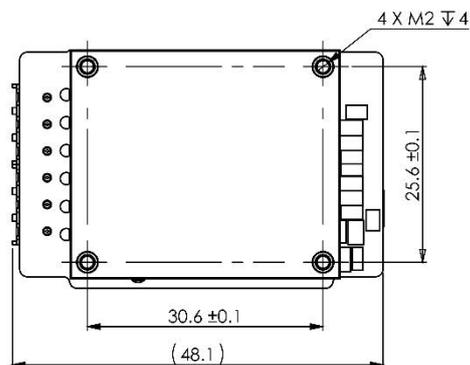
M = EtherCAT with Mini USB:

- EtherCAT or Ethernet
- Mini USB
- RS-232

**Options:**

Horizontally positioned power connector for drives rated current  $XX \leq 25A$

- 7 = • 24 V I/O & STO – High side logic (Source)
- 8 = • 5 V I/O & STO – High side logic (Source)
- 9 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_ECATT\_H-CONN\_USB-2160E

Figure 61: G-Solo Twitter –EtherCAT version (Option M) with Horizontal Phoenix connector



### 10.3.3. Vertical Power Connector G-SOLTWIRXX/YYME1SQ

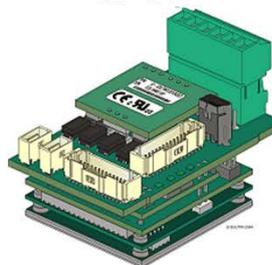
Dimensions (mm (in))	Weight g/oz
48.4 x 31.2 x 35.3 mm (1.91" x 1.23" x 1.39")	39.0 (1.38)

#### G-SOLTWIRXX/YYME1SQ

##### Power Supply & Heatsink Options:

S = Control Supply (VL) 11V – 95V

Blank = VL <40V



##### Network Communications:

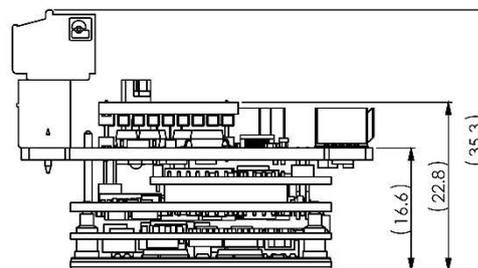
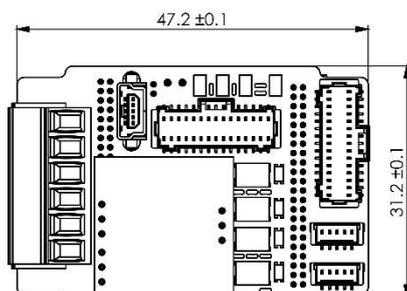
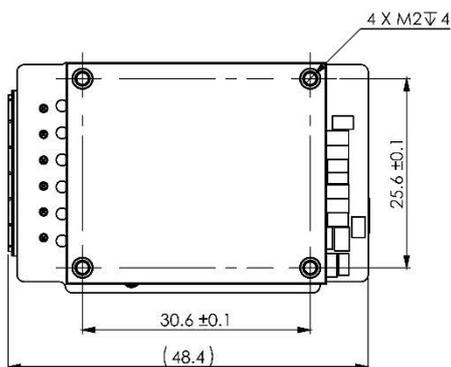
M = EtherCAT with Mini USB:

- EtherCAT or Ethernet
- Mini USB
- RS-232

##### Options:

Pluggable vertically positioned power connector for drives rated current XX ≤ 10A

- 4 = • 24 V I/O & STO – High side logic (Source)
- 5 = • 5 V I/O & STO – High side logic (Source)
- 6 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_ECATT\_V-CONN\_USB-218E

Figure 62: G-Solo Twitter –EtherCAT version (Option M) with Pluggable Vertical Phoenix connector



## 10.4. EtherCAT Option M with Heatsink

### 10.4.1. Wires to Power Supply G-SOLTWIRXX/YYME1HQ

Dimensions (mm (in))	Weight g/oz
47.2 x 41.3 x 29.8 (1.86" x 1.63" x 1.17")	81.5 (2.88)

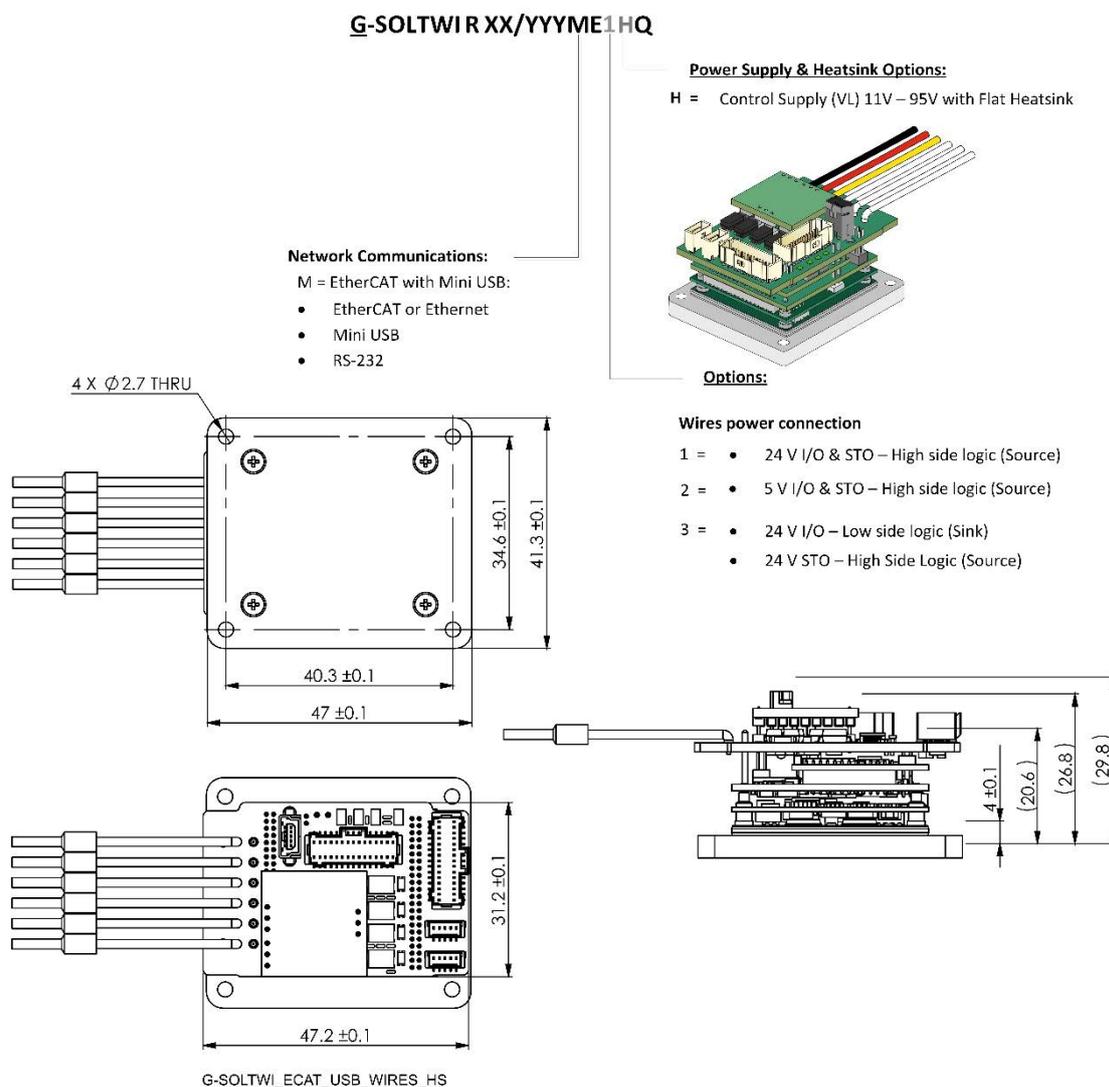
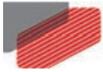


Figure 63: G-Solo Twitter –EtherCAT version (Option M) with wires to power supply and motor, and with Heat sink



### 10.4.2. Horizontal Power Connector G-SOLTWIRXX/YYME1HQ

Dimensions (mm (in))	Weight g/oz
48.1 x 41.3 x 29.8 mm (1.89" x 1.63" x 1.17")	57.5 (2.03)

#### G-SOLTWIRXX/YYME1HQ

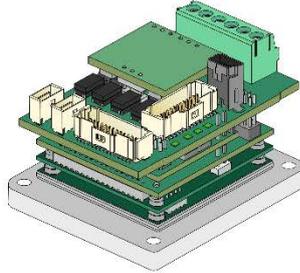
**Network Communications:**

M = EtherCAT with Mini USB:

- EtherCAT or Ethernet
- Mini USB
- RS-232

**Power Supply & Heatsink Options:**

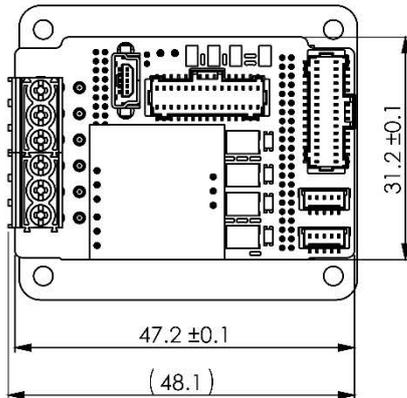
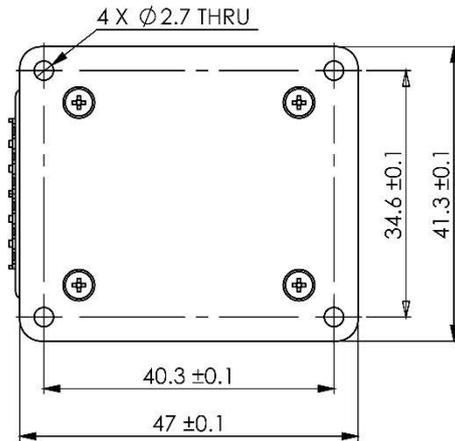
H = Control Supply (VL) 11V – 95V with Flat Heatsink



**Options:**

Horizontally positioned power connector for drives rated current XX ≤ 25A

- 7 = • 24 V I/O & STO – High side logic (Source)
- 8 = • 5 V I/O & STO – High side logic (Source)
- 9 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_ECATH\_CONN\_HS\_USB

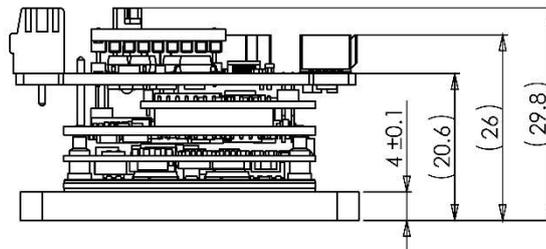


Figure 64: G-Solo Twitter –EtherCAT version (Option M) with Horizontal Phoenix connector and with Heat sink



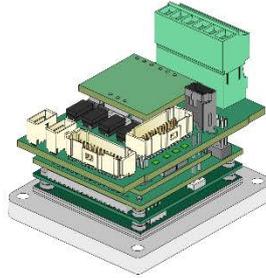
### 10.4.3. Vertical Power Connector G-SOLTWIRXX/YYME1HQ

Dimensions (mm (in))	Weight g/oz
48.4 x 41.3 x 39.3 (1.91" x 1.63" x 1.55")	60.0 (2.12)

#### G-SOLTWIR XX/YYY ME 1HQ

##### Power Supply & Heatsink Options:

H = Control Supply (VL) 11V – 95V with Flat Heatsink



##### Network Communications:

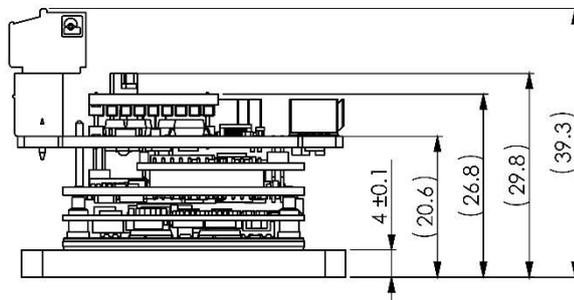
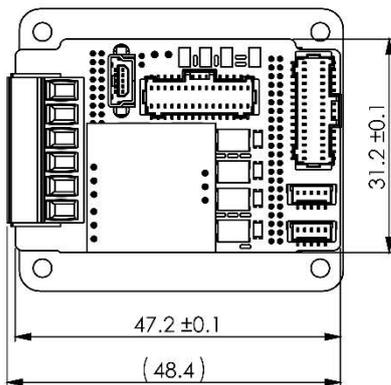
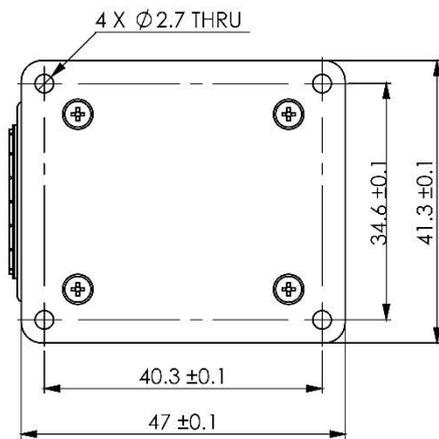
M = EtherCAT with Mini USB:

- EtherCAT or Ethernet
- Mini USB
- RS-232

##### Options:

Pluggable vertically positioned power connector for drives rated current XX ≤ 10A

- 4 = • 24 V I/O & STO – High side logic (Source)
- 5 = • 5 V I/O & STO – High side logic (Source)
- 6 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_ECATCHAT\_V-CONN\_HS\_USB

Figure 65: G-Solo Twitter –EtherCAT version (Option M) with Pluggable Vertical Phoenix connector and with Heat sink



## 10.5. CAN without Heatsink

### 10.5.1. Wires to Power Supply G-SOLTWIRXX/YYYSE1SQ

Dimensions (mm (in))	Weight g/oz
47.2 x 30 x 19.2 mm (1.86" x 1.18" x 0.76")	56.0 (1.97)

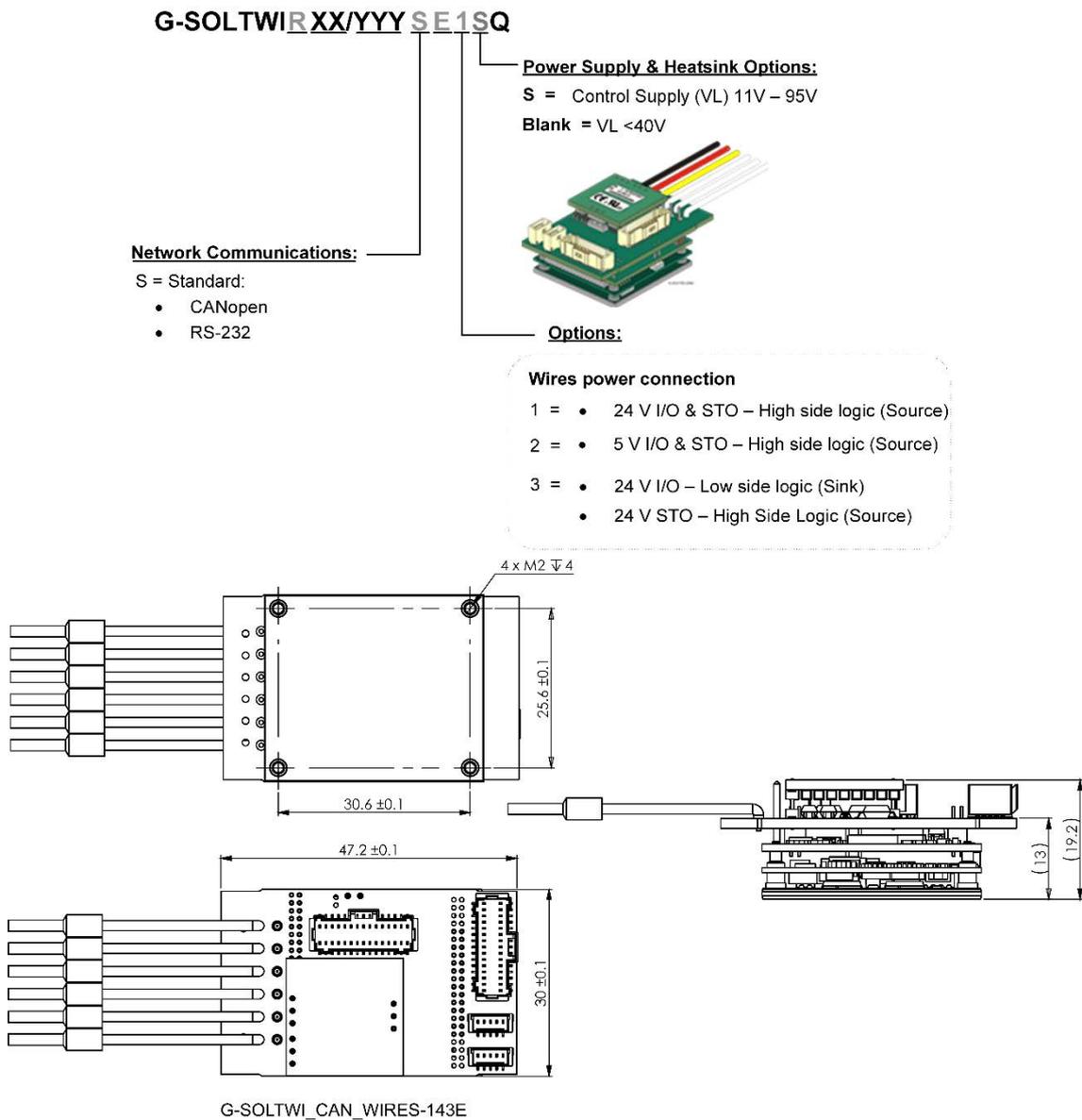


Figure 66: G-Solo Twitter –CAN version with wires to power supply and motor



### 10.5.2. Horizontal Power Supply G-SOLTWIRXX/YYYSE1SQ

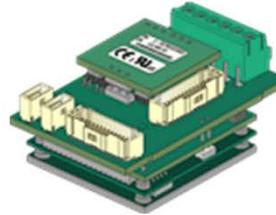
Dimensions (mm (in))	Weight g/oz
48.1 x 30 x 22.2 mm (1.89" x 1.18" x 0.87")	32.5 (1.14)

#### G-SOLTWIRXX/YYYSE1SQ

**Power Supply & Heatsink Options:**

S = Control Supply (VL) 11V – 95V

Blank = VL <40V



**Network Communications:**

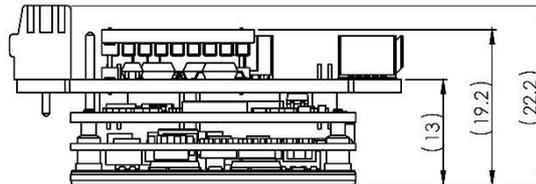
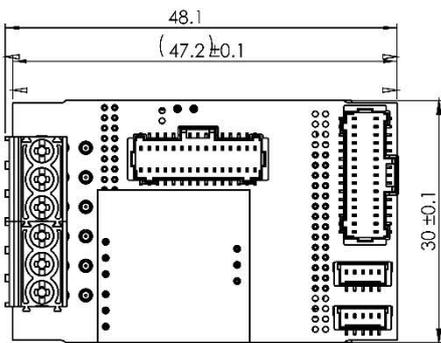
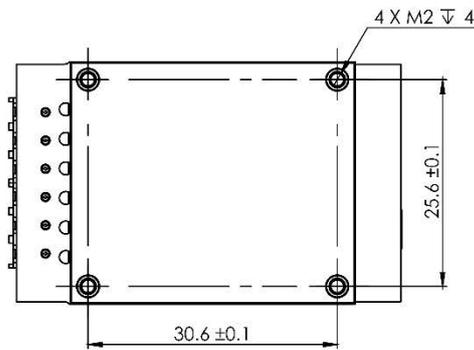
S = Standard:

- CANopen
- RS-232

**Options:**

Horizontally positioned power connector for drives rated current XX ≤ 25A

- 7 = • 24 V I/O & STO – High side logic (Source)
- 8 = • 5 V I/O & STO – High side logic (Source)
- 9 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_CAN\_H-CONN-221E

Figure 67: G-Solo Twitter –CAN version with horizontal power connector



### 10.5.3. Vertical Power Supply G-SOLTWIRXX/YYYSE1SQ

Dimensions (mm (in))	Weight g/oz
48.3 x 30 x 31.7 mm (1.9" x 1.18" x 1.25")	35.0 (1.23)

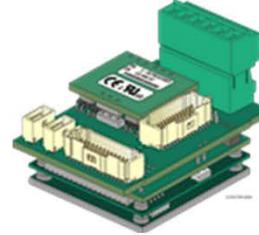
#### G-SOLTWIRXX/YYYSE1SQ

**Network Communications:**

- S = Standard:
- CANopen
  - RS-232

**Power Supply & Heatsink Options:**

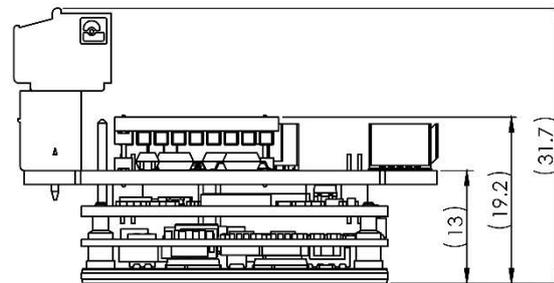
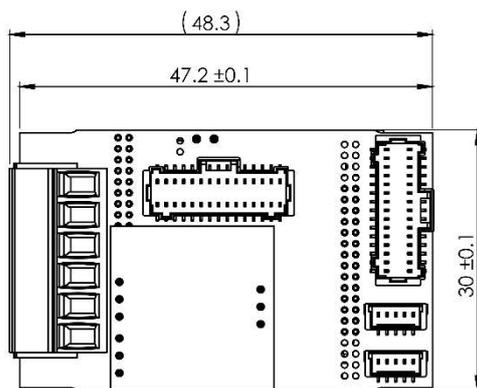
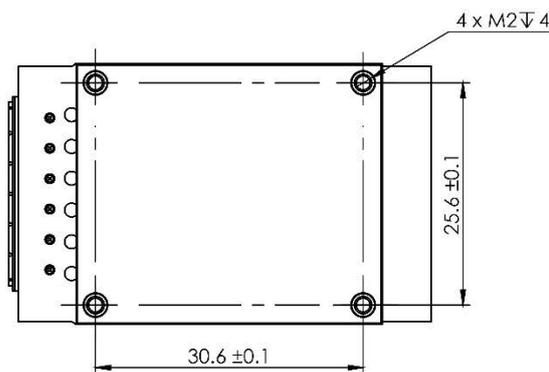
- S = Control Supply (VL) 11V – 95V  
 Blank = VL <40V



**Options:**

Pluggable vertically positioned power connector for drives rated current XX ≤ 10A

- 4 = • 24 V I/O & STO – High side logic (Source)
- 5 = • 5 V I/O & STO – High side logic (Source)
- 6 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_CAN\_V-CONN-1144E

Figure 68: G-Solo Twitter –CAN version with vertical power connector



## 10.6. CAN with Heatsink

### 10.6.1. Wires to Power Supply G-SOLTWIRXX/YYYSE1HQ

Dimensions (mm (in))	Weight g/oz
47.6 x 41.3 x 23.2 mm (1.87" x 1.63" x 0.91")	77.0 (2.72)

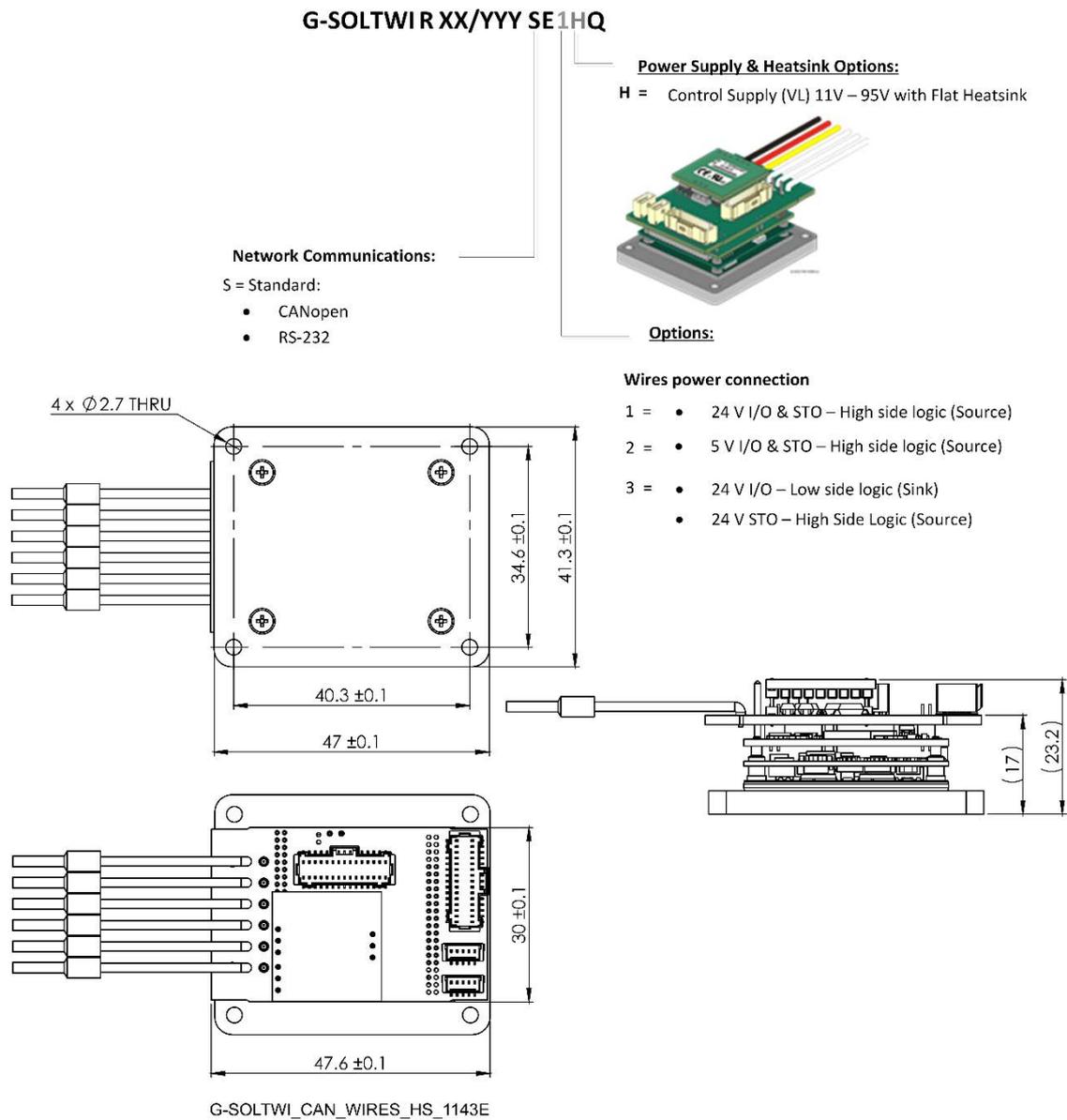


Figure 69: G-Solo Twitter –CAN version with wires to power supply and motor



### 10.6.2. Horizontal Power Connector G-SOLTWIRXX/YYYSE1HQ

Dimensions (mm (in))	Weight g/oz
48.5 x 41.3 x 26.2 mm (1.91" x 1.63" x 1.03")	53.5 (1.89)

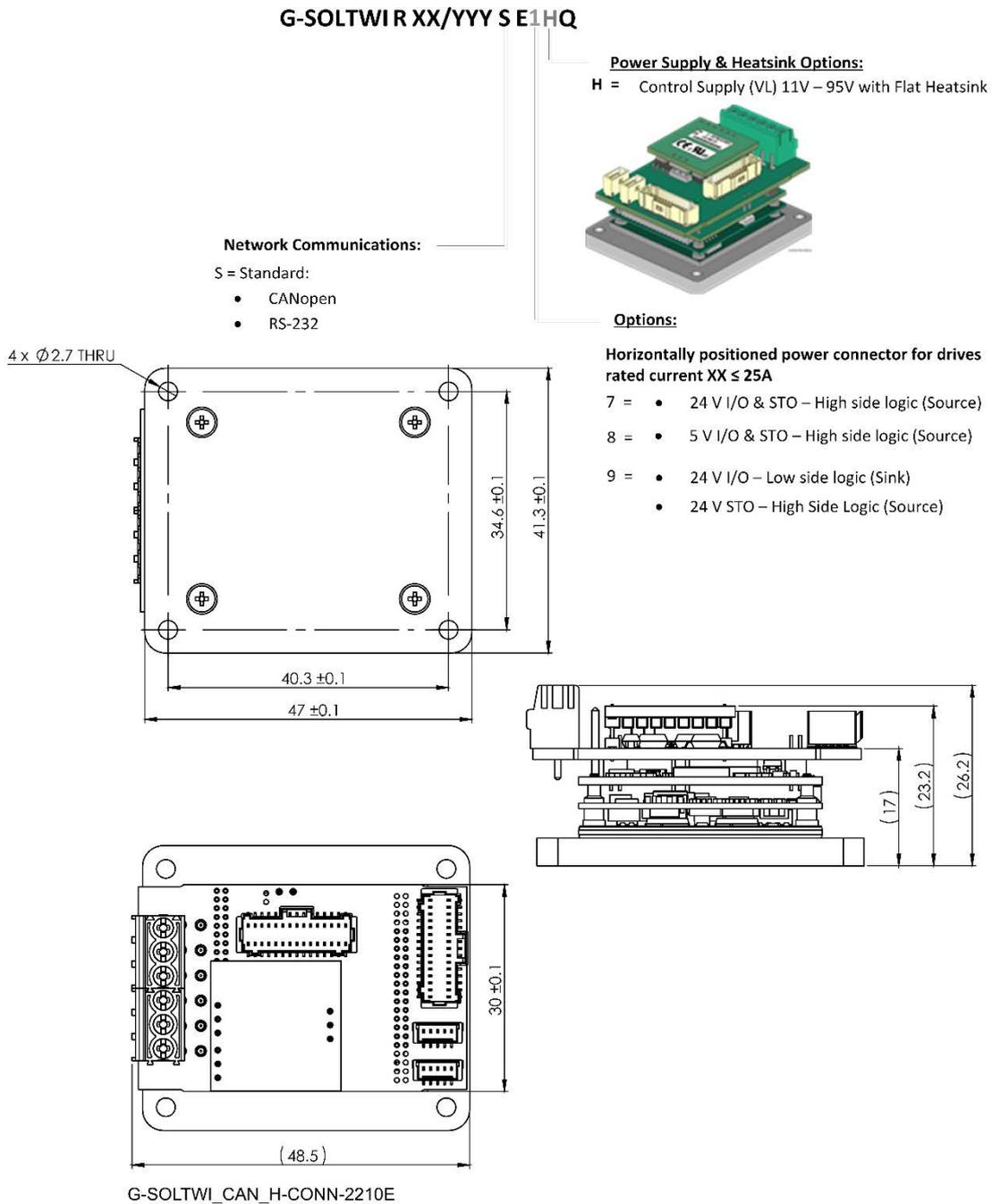


Figure 70: G-Solo Twitter –CAN version with horizontal power connector



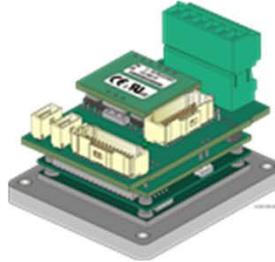
### 10.6.3. Vertical Power Supply G-SOLTWIRXX/YYYSE1HQ

Dimensions (mm (in))	Weight g/oz
48.7 x 41.3 x 35.7 mm (1.92" x 1.63" x 1.41")	56.0 (1.98)

#### G-SOLTWIR XX/YYY SE1HQ

**Power Supply & Heatsink Options:**

H = Control Supply (VL) 11V – 95V with Flat Heatsink



**Network Communications:**

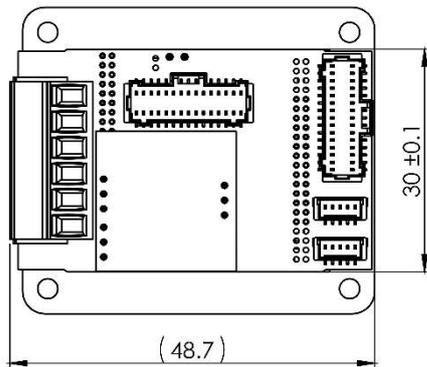
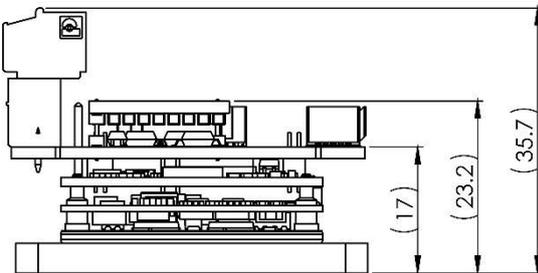
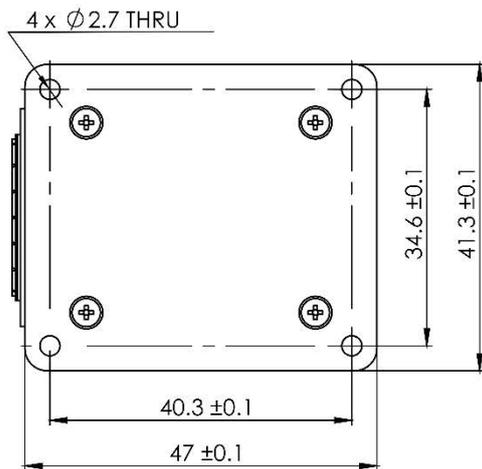
S = Standard:

- CANopen
- RS-232

**Options:**

**Pluggable vertically positioned power connector for drives rated current XX ≤ 10A**

- 4 = • 24 V I/O & STO – High side logic (Source)
- 5 = • 5 V I/O & STO – High side logic (Source)
- 6 = • 24 V I/O – Low side logic (Sink)
- 24 V STO – High Side Logic (Source)



G-SOLTWI\_CAN\_V-CONN\_HS-144E

Figure 71: G-Solo Twitter –CAN version with vertical power connector



## Chapter 11: Accessories

The model Power Supply & Heatsink Option: **H** is integrated with the Flat Heatsink P/N G-TWIHSFLAT01.

The following describes the accessory kits available for the Gold Solo Twitter.

Part Number	Description
CBL-GSOLTWIKIT03	Kit cable for EtherCAT model
CBL-GSOLTWIKIT04	Kit cable for CAN model
CBL-GSOLTWIKIT05	CONNECTORS AND PINS KIT
G-TWIHSFLAT01	Flat Heat-Sink Kit
G-TWIHSFINS01	FINs Heat-Sink Kit

A specific Crimping Tool (available for purchase from Elmo) is required to mount extra connecting pins on the wires. A number of wires are provided in the kit as pre-crimped for convenience:



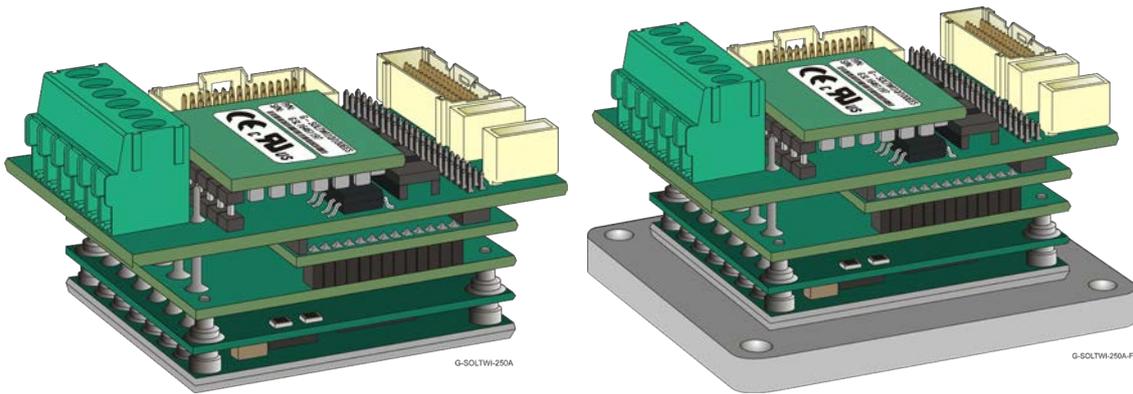
**Crimping Tool**  
**Molex P/N 63819-1500**  
**Elmo P/N TOOL-P000040**



**Pins for Single Row Connector**  
**MOLEX P/N 501334-0100**  
**Pins for Dual Row Connector**  
**MOLEX P/N 501193-3000**

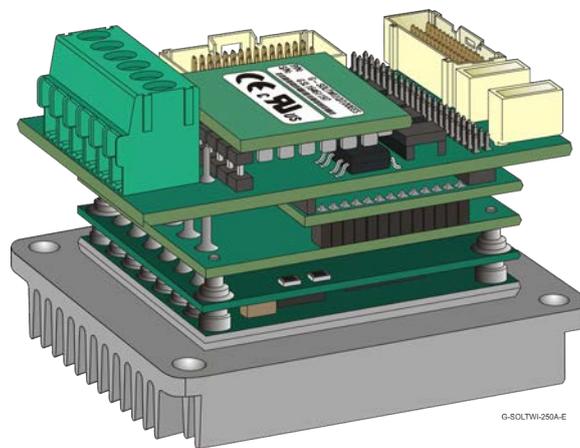


Optionally, the Gold Solo Twitter has two standard heat-sink configurations which are obtainable separately as kit accessories from Elmo:



**Default Heat Sink**

**Flat Heat Sink (P/N G-TWIHSFLAT01)**



**Fins Heat Sink (P/N G-TWIHSFINS01)**



### 11.1. Accessories Heat Sink Dimensions

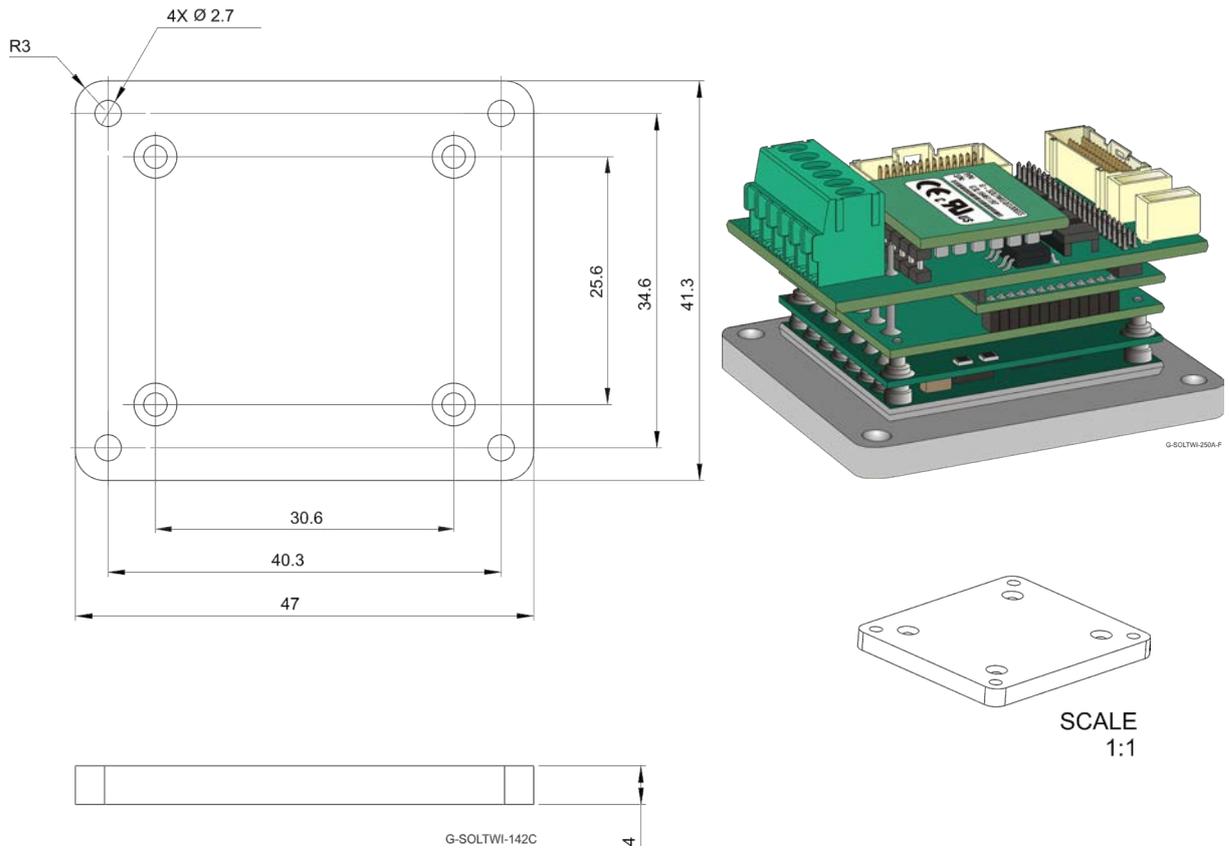


Figure 72: G-Solo Twitter – Flat Heat Sink (P/N G-TWIHSFLAT01) Dimensions



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