

The GOLD TWITTER

**Safety must be Certified,
Or Else it is not SAFE**



Elmo is Committed to Safety

Safety is:

The assurance that no hazardous incident might occur, to Human and/ or to Equipment, while “handling” and operating Elmo Products.



The GTWI's, The STDs Challenge

The STDs Compliance is a huge challenge when Controlling tremendous and extraordinary amount of Power/ Current / voltage drawn out of a super tiny package.

The NANO GTWII has to withstand:

1. Very High operating and breakdown Voltages.
2. Carrying huge currents
3. Absorb very high, very fast power transients.
4. Keep the temperatures all over the GTWI within the safety margins.
5. Not create EMI/RFI disturbances.
6. Be immune against external EMI/ RFI disturbances.
7. Withstand tough Environmental conditions.
8. Squeeze plenty of Safety Functionalities into “No Space”.
9. Very tough process of “Design for Reliability”.
10. And yet, keep the “Best In Class Servo”.

The GTWI's, The STDs Challenge

It is a giant goal to meet the GTWI servo design objectives and even more challenging goal to meet the STDs of Safety, EMC and Environmental.

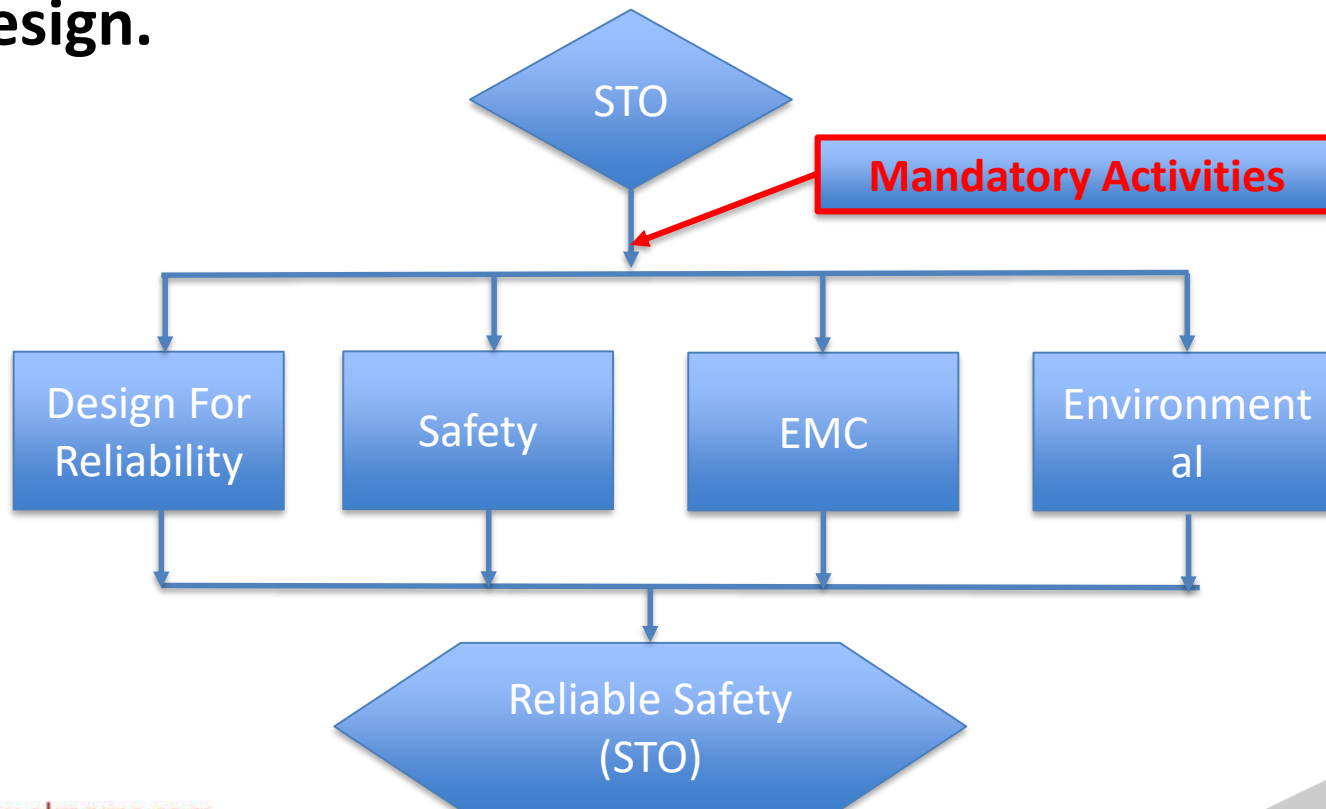
How the STDs challenges are met? Verified? Qualified? Guaranteed?

How the quality and the reliability are accomplished?

What STDs to Comply? Why?

The “route” today is very “simple” .

At the moment a company has decided to “adopt” the “STO” (Functional Safety) this decision determiners the whole STDs chain of SAFTEY, EMC, Environmental &Design.



Why Safety, EMC and Environmental STDs are required for the STO?

The STO has a very “simple” task of Reliable activating of the **Emergency Stop** in the Servo Drive.

All the activities done “around” the STO are to ENSURE the Reliability of the **Emergency Stop**.

And this includes also the STDs certification/compliance/
recognition/ approval/ etc..

Safety, Preventing Hazards

The task of the safety STD is that normal operating conditions all the hazards below must be avoided:

- Electric Shock
- Energy Hazards
- Fire
- Heat Hazards
- Mechanical Hazards
- Foreseeable Hazard Conditions

EMC, Free of EM Disturbances

The task of the EMC STD is to ensure the reliable operation of the STO even with excessive EM interferences

The EMC test verify & Qualify the GTWI's:

- The Susceptibility compliance (Immunity) is protecting “us” against external EM disturbances
 - and thus ensures the reliable STO operation of the GTWI.
- The Emission compliance (conducted and/or radiated) guarantees the GTWI does not creates EM disturbance to the “neighborhood” equipment,
 - and thus ensures the reliable STO operation (of the “neighborhood” equipment) when ever required to be activated.

Environmental Withstanding

The environmental verification & qualification tests are to ensure that the GTWI sustains the field operation conditions it was designed to, and thus the reliability of STO operation is guaranteed “at all conditions”.

- Temperature
- Mechanical Vibrations
- Mechanical Shock
- Dry Heat

Some of the Tests

- Voltage Breakdown Withstand Breakdown voltage (UL61800-5-1):
 - 1400VAC or 1980VDC @ 60sec
 - 1000V + (2 X Nominal Voltage Rating)
 - Any point within the GTWI and any component to the PE & the Heat-sink

- Voltage Immunity Electrostatic Discharge (ESD) – IEC 61000-4-2
 - 4 x 30 Pulses of 6 KV contact discharge

Some of the Tests

○ Voltage Immunity

■ Radiated Immunity – IEC 61000-4-3

Radiated, radio frequency electromagnetic field immunity test

80MHz to 1GHz - 20V/m

1.4GHz to 2GHz - 10V/m

2GHz to 2.7GHz - 3V/m

■ Electrical Fast Transients – IEC 61000-4-4

Electrical fast transient / burst immunity test

± 3.0KV on Power port

± 2.0KV on Earth & STO ports

± 1.0KV on Feedback & Signals ports

■ Surge Voltage – IEC 61000-4-5

Surge immunity test

± 4.0KV Line to Ground on Power Port

± 2.0KV Line to Ground on Power Port

± 2.0KV VP+ to PR terminals

± 1.0KV on Feedback and Signals Port

Some of the Tests

- Mechanical Vibration **IEC60068-2-6**

5.5.2. VIBRATION TEST PROCEDURE DESCRIPTION

Item Position	The test item was firmly attached to vibration exciter.
Vibration Axes	3 (X, Y, Z).
Sweeping Frequency	Logarithm. From 5 Hz To 500 Hz. Within 6:39 minutes.
Vibration Time in Each Axis	02:13 hours
Vibration Level	5 g max.

- In Elmo internal tests the sweeping frequency is up to 2000Hz.

Some of the Tests

- Mechanical Shock **IEC60068-2-27**

6.5.2. MECHANICAL SHOCK TEST PROCEDURE DESCRIPTION

Item Position	The test item was firmly attached to the shock machine.
Number of Shocks	3 shocks were conducted in each of the 6 directions of the test item.
Shock Level	15 g.
Time Duration	11 msec.
Shape	Half sine.
Total Number of Shocks	18 shocks.

Some of the Tests

- Damp Heat **IEC60068-2-78**

4.5.2. TEMPERATURE & HUMIDITY TEST PROCEDURE DESCRIPTION

Number of Cycles	One temperature & humidity cycle was conducted.
Cycle Time	96:50 hours

No.	Temperature Change		Humidity		Period	Remarks
	From	To	From	To		
1.	25°C	50°C	95%	95%	25 minutes	
2.	50°C	50°C	95%	95%	96 hours	
3.	50°C	25°C	95%	95%	25 minutes	

The GOLD TWITTER and STDs

Elmo designs, verifies, qualifies, approves, manufactures, maintains and tests the GOLD TWITTER in accordance to:

Functional Safety (STO)

Safe Torque Off (STO) Safety Standard	Item
IEC 61800-5-2:2007 SIL 3	Adjustable speed electrical power drive systems – Safety requirements – Functional
EN ISO 13849-1:2008 Cat 3, PL e	Safety of machinery — Safety-related parts of control systems.
EN 61508-1:2010 SIL 3	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61508-2:2010 SIL 3	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61508-3:2010 SIL 3	Functional safety of electrical/electronic/programmable electronic safety-related system

The GOLD TWITTER and STDs

Elmo designs, verifies, qualifies, approves, manufactures, maintains and tests the GOLD TWITTER in accordance to:

Safety:

Specification	Details
Approved IEC/EN 61800-5-1	Adjustable speed electrical power drive systems Safety requirements – Electrical, thermal and energy
Recognized UL 61800-5-1	Adjustable speed electrical power drive systems Safety requirements – Electrical, thermal and energy
Conformity with CE 2006/95/EC	Low-voltage directive 2006/95/EC
Recognized CSA C22.2 NO. 14-13 Or Recognized CSA C22.2 NO. 274-13	Industrial Control Equipment Adjustable drive speeds

The GOLD TWITTER and STDs

Elmo designs, verifies, qualifies, approves, manufactures, maintains and tests the GOLD TWITTER in accordance to:

Environmental:

Specification	Details
Approved IEC60068-2-78	Environmental testing – Damp heat, steady state
Approved IEC60068-2-6	Environmental testing –Vibration (sinusoidal)
Approved IEC60068-2-2	Environmental testing – Dry heat
Approved IEC60068-2-27	Environmental testing procedures - Shock

The GOLD TWITTER and STDs

Elmo designs, verifies, qualifies, approves, manufactures, maintains and tests the GOLD TWITTER in accordance to:

EMC:

Specification	Details
Approved IEC/EN 61800-3	Adjustable speed electrical power drive systems
In compliance with EN 55011 Class A with EN 61000-6-2 : Immunity for industrial environment, according to: IEC 61000-4-2 / criteria B IEC 61000-4-3 / criteria A IEC 61000-4-4 / criteria B IEC 61000-4-5 / criteria B IEC 61000-4-6 / criteria A IEC 61000-4-8 / criteria A IEC 61000-4-11 / criteria B/C	Electromagnetic compatibility (EMC)
Approved IEC 61326-3-1	Electrical equipment for measurement, control and laboratory use. Standard required for STO.

It Must Be Certified

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Gold WHISTLE		
Model Name	Model Part Number	Version
Gold Whistle	G-WHI	V03
Gold DC Whistle	G-DCWHI	V03
Gold Solo Whistle	G-SOLWHI	V03
Gold Hornet	G-HOR	V03
Gold Solo Hornet	G-SOLHOR	V03
Gold DC Hornet	G-DCHOR	V03
Gold Duo	G-DUO	V03
Gold Duo AMBA	G-DUO-AMBA	V03
Gold Uno AMBA	G-UNO-AMBA	V03
Gold Twitter		
Model Name	Model Part Number	Version
Gold Twitter	G-TWI	V03
Gold Bee	G-BEE	V03
Gold Solo Twitter	G-SOLTWI	V03

ZERTIFIKAT ♦ CERTIFICATE ♦ CERTIFICADO ♦ CERTIFICADO ♦ CERTIFICAT

CERTIFICATE

No. Z10 13 08 84596 001

Holder of Certificate: Elmo Motion Control Ltd.
60 Amal St. P.O. Box 3078
49516 Petach-Tikva
ISRAEL

Factory(ies): 84596

Certification Mark:



Product: Safety Related Programmable Electronic System

Model(s): Drive System GOLD LINE

Parameters: Safety Function: STO (EN 61800-5-2)
PL e, CAT 3 (EN ISO 13849)
SIL 3 (EN 61508)

Further approvals can be found in the report below.

The report below and the user documentation in the currently valid revision are mandatory part of this certificate. The product complies with the following listed safety requirements only if the specifications documented in the currently valid revision of this report are met.

Tested according to: EN 61508-1:2010 (SIL 3)
EN 61508-2:2010 (SIL 3)
EN 61508-3:2010 (SIL 3)
EN 61800-5-2:2007
EN ISO 13849-1:2008 (Cat 3, PL e)

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: EP85169C

Date, 2013-08-12 (Peter Weiss)

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TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstraße 65 · 80339 München · Germany

TUV®



Product Service

It Must BE Certifies, Or else...

Warn the customers not to be trapped in BS

Such as :

- A “General” certification without the with no “Annex” with the detailed List
- Or
- Hidden messages such as

■ **Do not use the STO function until this functionality has been approved.** The STO input is functional but not yet independently certified. Motor Power Company is preparing the final circuit design updates to be submitted for formal (SIL 2) (PI d) (Cat 2) STO certification. These updates will not change the wiring or functional operation.

CERTIFICATE ◆ CERTIFICADO ◆ CERTIFIKAT ◆ 認証証書 ◆ CERTIFICATE ◆ CERTIFICATE



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Tested according to: EN 61506-1:2010 (SIL 3)
EN 61508-2:2010 (SIL 3)
EN 61508-3:2010 (SIL 3)
EN 61800-5-2:2007
EN ISO 13849-1:2008 (Cat 3, PL e)

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: EP85189C

Date: 2013-08-12  (Peter Weiss)

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	not configured
Compliance Standard	UL - UL508c (compliance testing in progress by TUV), STO - Safe Torque Off (compliance testing in progress), RoHS CE - EMC Directive 2004/108/EC, standard IEC61800-3, CE Low Voltage Directive 73/23/EEC IEC61800-5-1

There is no such thing as “In Progress”, or “Do not use the STO..
It is Certified , or it is BS