PRODUCT SUMMARY | SCR 07927 | REV 2 | LAST UPDATE: 19/01/26

TAG-700

TAG-700 is the main processing unit for powertrain control of a racing car. It may be used with an external engine interface unit to provide time synchronous control of ignition and direct or manifold injection, along with all other powertrain control functions. The TAG-700 provides a powerful compute platform with ultra-low latencies for customer applications and is based on 64-bit quad-core application processors with an FPGA accelerated IO front end. Application code is automatically generated from MATLAB/Simulink models. Advanced data logging, high-speed telemetry output and rich communications are all provided in one unit. TAG-700 integrates seamlessly with the Motion Applied suite of software tools including MCT, System Monitor and ATLAS.

APPLICATION

- Advanced Powertrain control and monitoring for racing cars as used in F1 2026 SECU
- Support for up to 8-cylinder engine concepts
- Throttle-by-wire control
- Clutch-by-wire control
- Semi-automatic gearbox control
- Reduced Data Access support for application IP protection including encryption
- Ultra high-speed onboard data logging
- Encrypted telemetry output
- Ethernet connection to calibration applications and data analysis tools (System Monitor and ATLAS)
- XCP and ASAM Support
- SQL data service enabled toolchain

KEY FEATURES

- Application processing power Coremark ~33,000
- Extremely low latency, high frequency input sampling
- Digital filtering and anti-aliasing on all analogue inputs
- Data logging memory up to 256GB

SENSOR INPUTS

- Total of 139 Inputs
- 71 x general-purpose 0 to 5V analogue inputs (12-bit, 10ksps, 4 of which are software configurable as general-purpose TTL outputs)
- 25 x general-purpose configurable 0 to 5V or PT1000 analogue inputs (12-bit, 10ksps)
- 8 x general-purpose configurable 0 to 5V analogue inputs with software selectable 1k pull-up for use as digital switches (12-bit, 10ksps)
- 8 x high-speed 0 to 5V analogue inputs (16-bit, 100ksps)
- 6 x general purpose 0 to 5V analogue inputs or knock sensor inputs (12-bit, 100ksps)
- 1 x “Pits pedal” and 1 x “Ethernet IP address” analogue inputs (12-bit, 1ksps)
- DHE and Inductive inputs for Crank and Cam
- 10 x DHE speed inputs (maximum 39kHz)
- 2 x differential K-type thermocouple inputs (12-bit)
- 2 x wide-band lambda controllers (12-bit) NTK – BOSCH sensors supported
- 1 x Ignition switch input

COMMUNICATIONS

- 1 x Wired 1000BASE-T Ethernet interface (10/100/1000Mbps) for PC and Telemetry
- 6 x Wired 100BASE-T1 interfaces with VLAN
- 18 x CAN FD or CAN 2.0B interfaces (4Mbps maximum)
- 1 x RS232 interface (250kbps maximum)

For more technical details get in touch
Email: sales@motionapplied.com
Website: www.motionapplied.com

TAG-700

OUTPUTS

- 14 x ±12mA servo (MOOG) valve drive stages (10ksps)
- 14 x 1A high-side drive stages
- 6 x 3A low-side drive stages
- 8 x 7A high-side drive stages
- 8 x TTL injection control outputs
- 8 x open-drain ignition control outputs
- 8 x general purpose open-drain outputs
- 2 x RS-422 differential outputs for 1ms time synchronisation and engine synchronisation signals
- 4 x general-purpose TTL outputs (all of which are software configurable as analogue inputs)
- 2 x oscilloscope outputs
- 10 x 150mA 12V sensor supplies
- 1 x 150mA 10V supply for load cell measurement
- 10 x 150mA 5V precision sensor supplies

ELECTRICAL

- Supply voltage 7.5 to 16V DC
- Supply voltage not to exceed 17V continuous (the unit is protected against transients and reverse polarity)
- Supply current quiescent (ignition off) 4mA
- Supply current operating (no load on outputs) Less than 3A typical at 13.8V
- Supply current operating (max load on supplies) TBCA typical at 13.8V
- 64-bit Real Time Operating System
- Internal tri-axis accelerometer

MECHANICAL

- CNC Billet 6082-T6 case (hard black anodised)
- Mass 1.14kg

ENVIROMENTAL AND COOLING

- Rated to IP65
- Splash resistant to standard motorsport fluids
- Case sealed with o-rings
- Maximum humidity 100%
- Minimum operating temperature 0°C
- Internal temperature not to exceed 70°C as measured by internal diagnostic sensors
- When driving loads, adequate forced-air cooling must be applied to a single face ensure the internal operating temperature remains within specified limits
- Storage temperature -25°C to +85°C
- Vibration 100 to 1000Hz, all axes, 24 hours
- Vibration isolation is recommended

SOFTWARE TOOLS

- MCT – Motion Control Toolbox
- SM – System Monitor
- ATLAS – Advanced Telemetry Live Acquisition System

CONNECTOR DEFINITION

- Integral, sealed, LEMO 5M motorsport connectors
- Connector A 66-way
- Connector B 114-way
- Connector C 114-way
- Connector D 66-way

EMC

- Complies with the essential protection requirements of 2014/30/EU

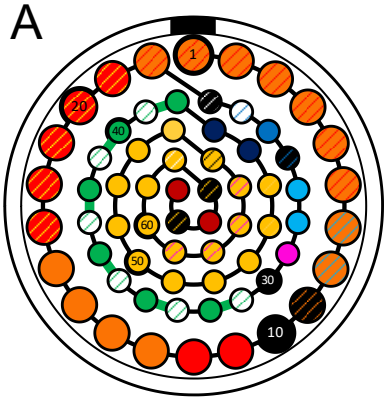
SERVICE

- Recommended service interval 12 months

For more technical details get in touch
Email: sales@motionapplied.com
Website: www.motionapplied.com

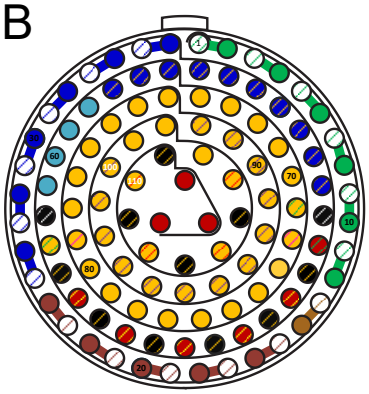
TAG-700

A



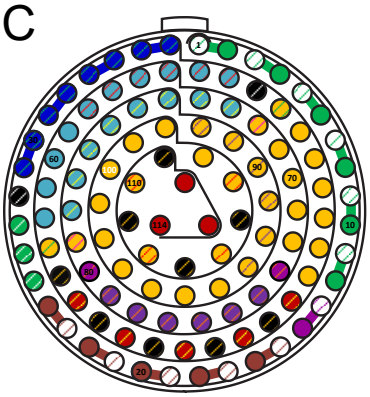
Connector A : Lemo 5M.366			
2	VBAT	1	1000BASE-T1+ 1000BASE-T1-
2	PWRGND	6	CAN FD+ CAN FD-
5	VBHSIDE	1	RS-232
1	LSIDEGND	12	ANALOGUE INPUT
1	DGND	4	ANALOGUE INPUT / SWITCH
2	AGND	1	ANALOGUE PITS PEDAL
1	SCREEN	1	ANALOGUE IP ADDRESS
4	7A HS	1	IGNITION SW
7	1A HS	2	SCOPE OUT
2	3A LS	2	5V SENSOR SUPPLY

B



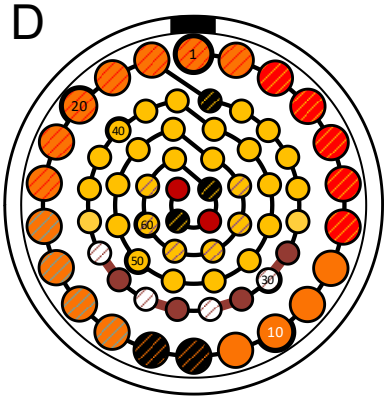
Connector B : Lemo 5M.144			
2	DGND	4	GPOD
10	AGND	3	5V SENSOR SUPPLY
6	100BASE-T1+ 100BASE-T1-	1	10V SENSOR SUPPLY
6	CAN FD+ CAN FD-	5	12V SENSOR SUPPLY
22	ANALOGUE INPUT	1	TIMESYNC+ TIMESYNC-
4	ANALOGUE INPUT 100K	5	MOOG+ MOOG-
2	ANALOGUE INPUT / TTL		
13	ANALOGUE INPUT / PT1000		
2	ANALOGUE INPUT / SWITCH		
10	DHE		

C



Connector C : Lemo 5M.144			
2	DGND	2	THERMOCOUPLE
9	AGND	4	GPOD
6	CAN FD+ CAN FD-	6	IGN TRIG
20	ANALOGUE INPUT	8	INJ TRIG
4	ANALOGUE INPUT 100K	3	5V SENSOR SUPPLY
2	ANALOGUE INPUT / TTL	5	12V SENSOR SUPPLY
6	ANALOGUE INPUT / PT1000	1	ENGSYNC+ ENGSYNC-
2	ANALOGUE INPUT / SWITCH	5	MOOG+ MOOG-
2	LAMBDA		
4	INDUCTIVE SPEED		

D

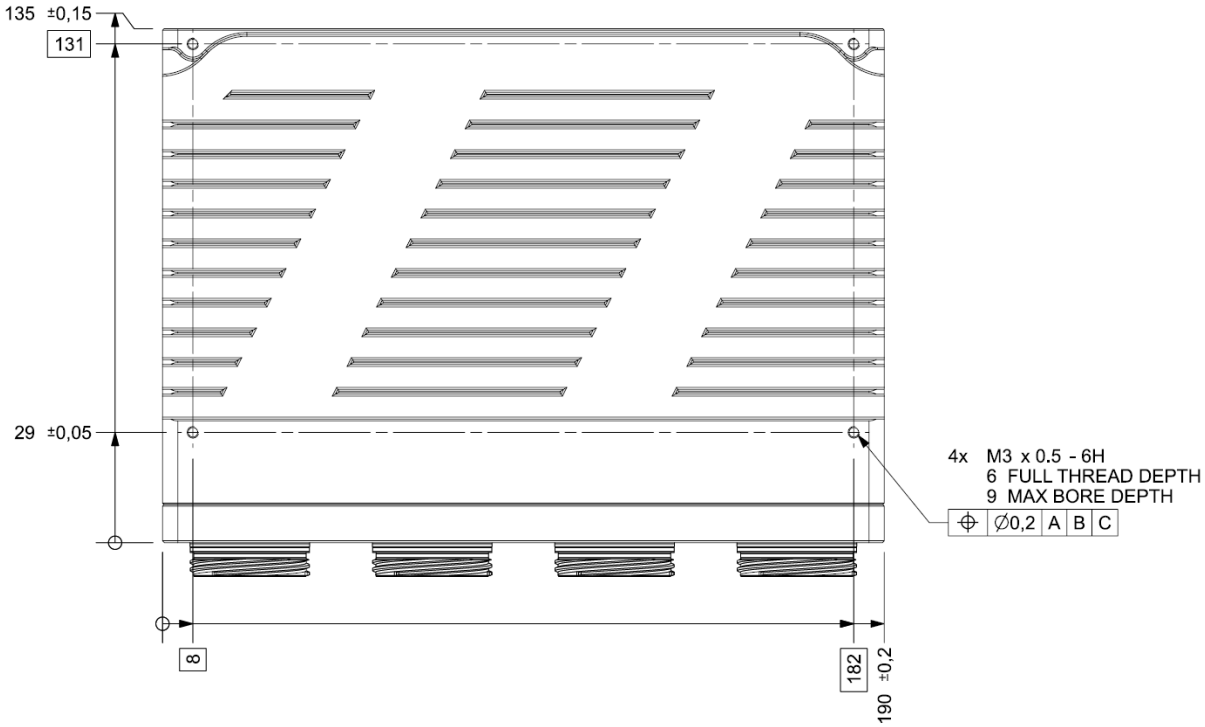


Connector D : Lemo 5M.366	
2	LSIDEGND
5	VBHSIDE
3	AGND
4	7A HS
7	1A HS
4	3A LS
25	ANALOGUE INPUT
6	ANALOGUE INPUT / PT1000
2	5V SENSOR SUPPLY
4	MOOG+ MOOG-

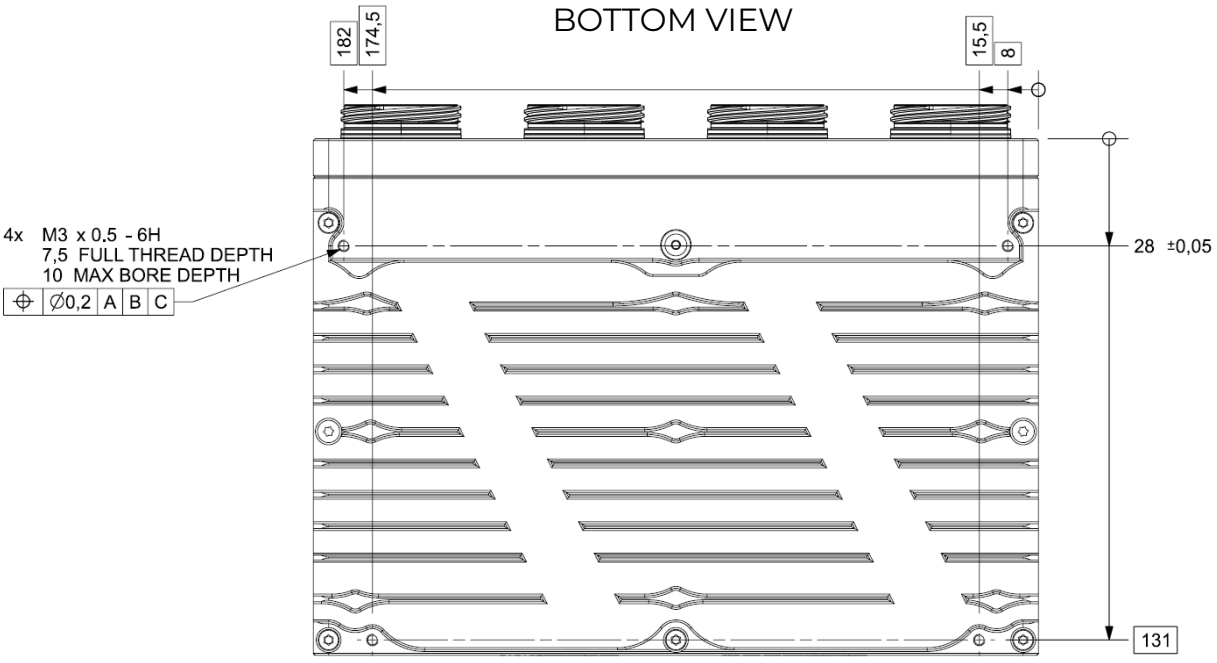
For more technical details get in touch
Email: sales@motionapplied.com
Website: www.motionapplied.com

TAG-700

TOP VIEW



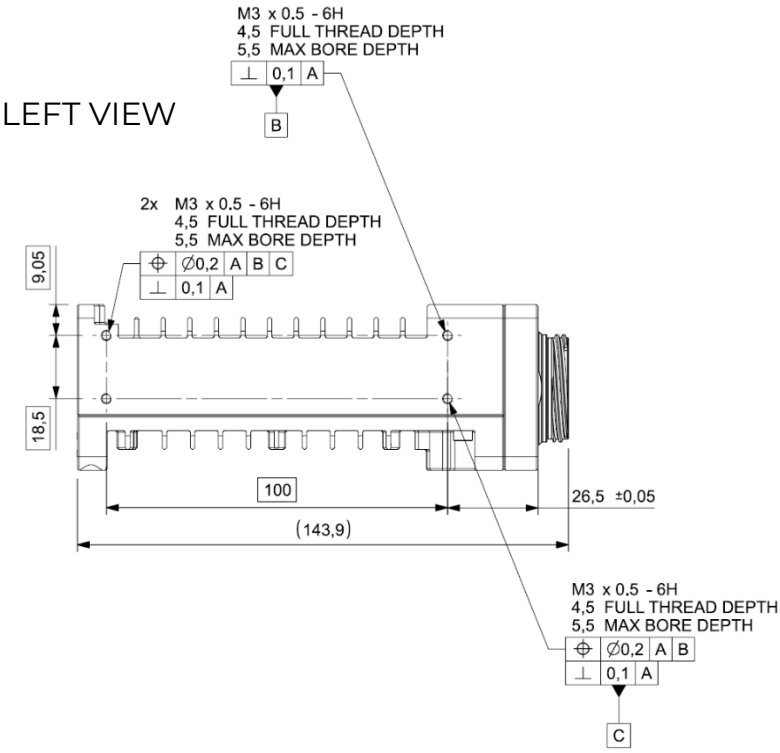
BOTTOM VIEW



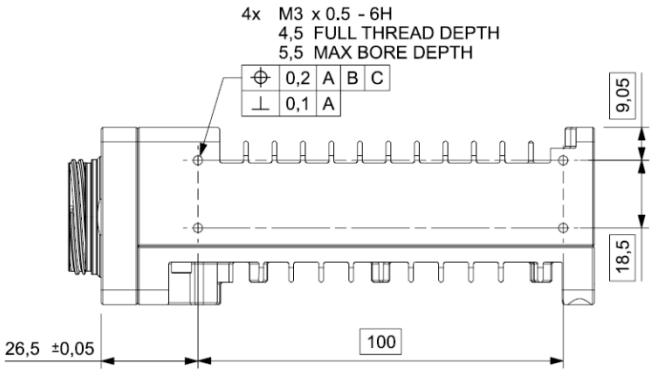
For more technical details get in touch
Email: sales@motionapplied.com
Website: www.motionapplied.com

TAG-700

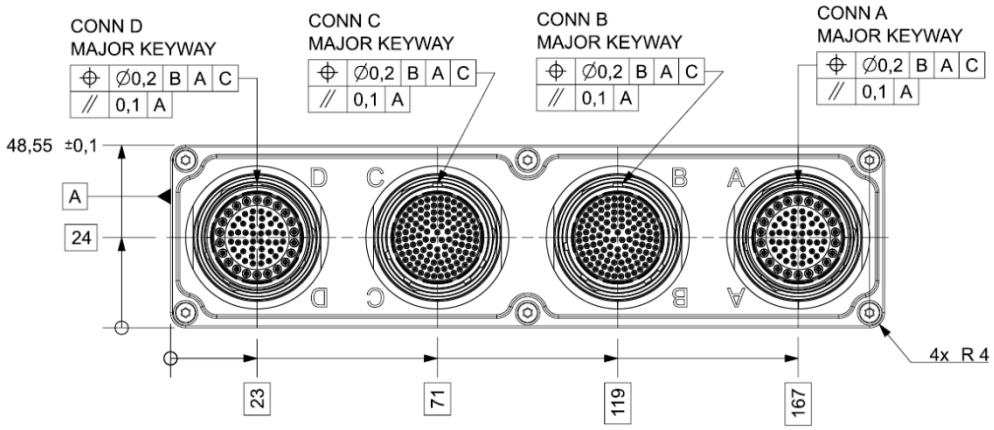
LEFT VIEW



RIGHT VIEW



FRONT VIEW



NOTES;
1. TAG-700 UNIT ORDERCODE: FG O 030 072 036 000

CONN	UNIT CONN PART No.	MATING HALF CON PART No.
A	HEX.5M.366.XRY44P	FMX.5M.366.XRYT44
B	HEX.5M.114.XLYP	FMX.5M.114.XLMT
C	HEV.5M.114.XLYP	FMV.5M.114.XLMT
D	HEV.5M.366.XRY44P	FMV.5M.366.XRYT44

For more technical details get in touch
Email: sales@motionapplied.com
Website: www.motionapplied.com