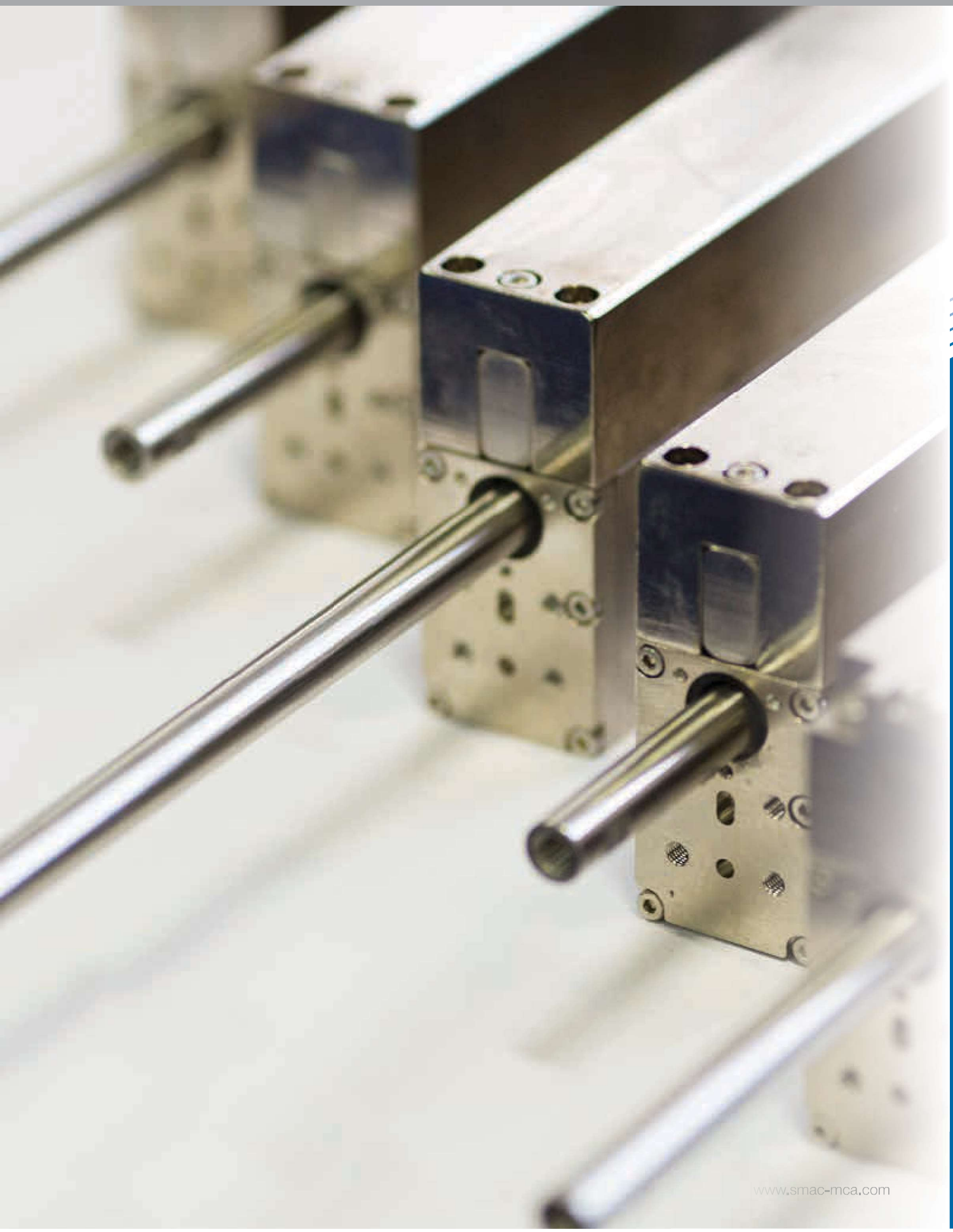


VLC Controllers

VLC DC brushed/brushless motor controllers/drivers are designed and manufactured by SMAC. This enables SMAC to offer efficient, competitively-priced solutions with no loss in features or functionality. The product can be adjusted by SMAC to a specific design, or to market or customer needs. SMAC offers a range of single and multi-axis controllers as well as stand-alone amplifiers. Complimentary standard programming software is available. Controllers can also be programmed by mnemonic type command instructions via an RS-232 interface into NVRAM and allows code to be stored in non-volatile RAM, which is then used to enable movements to be made in three different modes. They require no supplementary software. SMAC supports connectivity with a different type of fieldbus systems such as Ethernet/IP, EtherCAT® and CANopen. Please contact us for more information.

	Part Number	Motor type	Stand-alone	Built-in	Output (Standard)	Digital input	Digital output	Analog input *	Analog output	STO (Safe Torque Off)	Commu-nication interfaces
Single Axis	VLCI-R3	brushed/ brushless		●	3.5 A cont., 6.5 A peak	4 (opto-isolated)	4 (opto-isolated)	1 Diff	1	2 In, 1 Out	RS232
	VLCI-X1		●		3.5 A cont., 6.5 A peak	4 (opto-isolated)	4 (opto-isolated)	1 Diff.	1 S.E.	2 In, 1 Out	RS232
	VLC-1-07		●		6 A cont., 7.8 A peak	8 (opto-isolated)	8 (opto-isolated)	2 Diff., 3 S.E.	3 S.E.	2 In, 1 Out	Serial (UART)
	VLC-1-13		●		10 A cont., 13 A peak	8 (opto-isolated)	8 (opto-isolated)	2 Diff., 3 S.E.	3 S.E.	2 In, 1 Out	Serial (UART)
	VLC-ETC		●		3.5 A cont., 6.5 A peak	4 (opto-isolated)	4 (opto-isolated)	1 Diff.	1 S.E.	2 In, 1 Out	Serial (UART), EtherCAT (2-ports)
	VLCI-CAN-07		●		3.5 A cont., 6.5 A peak	4 (opto-isolated)	4 (opto-isolated)	1 Diff.	n/a	2 In, 1 Out	RS232, CAN
Dual Axis	VLC-25-07		●		6 A cont., 7.8 A peak	4 (opto-isolated)	4 (opto-isolated)	2 Diff., 3 S.E.	2 S.E.	2 In, 1 Out	RS232
	VLC-25-13		●		10 A cont., 13 A peak	4 (opto-isolated)	4 (opto-isolated)	2 Diff., 3 S.E.	2 S.E.	2 In, 1 Out	RS232
	VLC-2-EIP-07		●		6 A cont., 7.8 A peak	4 (opto-isolated)	4 (opto-isolated)	2 Diff., 3 S.E.	2 S.E.	2 In, 1 Out	RS232, Ethernet/IP
	VLC-2-EIP-13		●		10 A cont., 13 A peak	4 (opto-isolated)	4 (opto-isolated)	2 Diff., 3 S.E.	2 S.E.	2 In, 1 Out	RS232, Ethernet/IP

* Diff. = Differential and S.E. = Single-Ended

VLCI-R3

VLCI-X1

VLC-1-07 / VLC-1-13

VLC-ETC

VLCI-CAN-07

VLC-25-07 / VLC-25-13

VLC-2-EIP-07/ VLC-2-EIP-13

CABLES

Why Use SMAC Cables?

SMAC actuators are used in numerous high speed, high cycle applications and are guaranteed for millions of cycles. For this reason, it is imperative that the cables used to connect with our actuators are capable of similar arduous duty cycles and life span. Only cables manufactured by SMAC can be guaranteed to meet the rigorous standards required during use. Many years of experience has taught us that cheaper third party cables simply are not up to the task required. They are, in fact, one the most common causes of technical problems experienced by our customers.

	Single Axis Controller					Dual Axis Controller	
Actuator	Stand Alone				Built-in	Stand Alone	
Models	VLCI-X1	VLC-ETC	VLCI-CAN-07	VLC-1-07/13	VLCI-R3	VLC-25-07/13	VLC-2 EIP-07/13
CBL* / CTL*	VAH-6LOD26-03			VAH-4LOD26-03			
2x CBL* / CTL*						VAH-4LTD26-03	
LBL / LDL	MAH-6LOD26-03			MAH-4LOD26-03			
LDL Built-in Controller Type					MAH-VCI2626-02		
LBR	MAH-6RED026-03			MAH-4RED026-03		MAH-4RTD026-03	
LCA(S)*/ LCB/ MLA (single-pole/brushless)	VAH-6LOD26-03			VAH-4LOD26-03			
LCA (S)* (Multi-pole/brushless)	MAH-6LOD26-03			MAH-4LOD26-03			
2x LCA(S)*/ LCB/ MLA						VAH-4LTD26-03	
2x LBL* / LCA (S)* (Multi-pole/brushless)						MAH-4LTD026-03	
SLA10/ SLA25*	VAH-6LOD26-03 (SLA10 requires LAH-PT12-26 cable)			VAH-4LOD26-03			
LAL35/LAL95	VAH-6LOD26-03			VAH-4LOD26-03			
LAL55/LAL300/LAL500	VAH-6LOD-03			VAH-4LOD-03			
2x LAL35/LAL95						VAH-4LTD26-03	
2x LAL55/LAL300/LAL500						VAH-4LTD-03	
LAR35	VAH-6RED26-03 (with 2x controllers)			VAH-4RED26-03 (with 2x controllers)		VAH-4RTD26-03	
LAR31-030	MAH-6RED226-03 (with 2x controllers)			MAH-4RED226-03 (with 2x controllers)		MAH-4RTD226-03	
LAR31-050 / LAR51-058	MAH-6RED026-03 (with 2x controllers)			MAH-4RED026-03 (with 2x controllers)		MAH-4RTD026-03	
LAR55/LAR95/LAR300	VAH-6RED-03 (with 2x controllers)			VAH-4RED-03 (with 2x controllers)		VAH-4RTD-03	
LCR13/LCR16/LCR20 Under 25mm stroke	MAH-6RED226-03 (with 2x controllers)			MAH-4RED226-03 (with 2x controllers)		MAH-4RTD226-03	
LCR13/LCR16/LCR20 35mm stroke and above	MAH-6RED026-03 (with 2x controllers)			MAH-4RED026-03 (with 2x controllers)		MAH-4RTD026-03	
MGR	VAH-6RED26-03 (with 2x controllers)			CAH-4RED26-03 (with 2x controllers)		VAH-4RTD26-03	
GRP20/GRP35/GRP50***	VAH-6RED26-03 (with 2x controllers)			VAH-4RED26-03 (with 2x controllers)		VAH-4RTD26-03	
LXY15/LXY25	GRP-6RED26-03 (with 2x controllers)			GRP-4RED26-03 (with 2x controllers)		GRP-4RTD26-03	

* No cable required for flying lead option. *** Old type of GRP50 requires LAH-GRP26-03 cable.

Options & Modifications (Consult factory for availability)

Cable length ---------- 3m standard, optional 10m length is available. Consult factory for other length.

Superflex ---------- Suitable for robotic applications.

Non-SMAC controller connector ---------- Consult factory for details.

GRAPHICAL USER INTERFACE

Graphical User Interface (GUI)

SMAC Graphical User Interface provides a simple and straightforward way to quickly configure motion parameters of a variety of SMAC single/dual axis actuators and controllers. Pre-installed, user configurable application-based GUIs are also available.

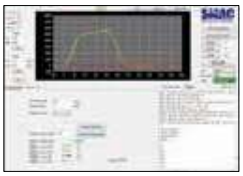
- Little to no programming experience required
- Menu-driven, Windows based, easy setup
- Pre-programmed with application-specific features
- Real time analysis
- Data and graphical feedback tools
- Built-in tutorial and help features

LCC Control Center

Achieve high level programming with no programming experience, monitoring and logging of parameters, fine-tuning of control parameters for LCC and CBC controller.

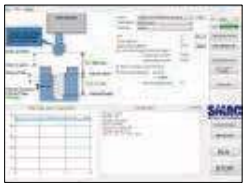
LAC-X Editor

Easy setup and tuning of control parameters for LAC-1 and LAC-25.



Thread Check Center: TCC

User configurable Thread-Checking applications. Fully automated 100% inspection of internal & external threads. Verification of counter bore height, thread pitch, oversized/ undersized threads, cross thread and shallow thread, etc.



Capping Control Center: CCC

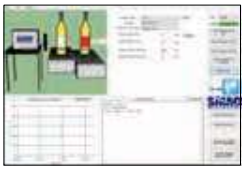
User configurable threaded bottle/container capping applications. Detect and report no/ obstructed cap. Adjust force and torque, show the different quality check capabilities such as cap height, torque limit, force required to press-in, and even check the clicks on child proof caps.

Gauging Control Center: GCC

User configurable gauging applications. Provide real time plot of measured values in relation to limits. The user may save a .csv or image file of the measured values or graph area respectively for data logging.

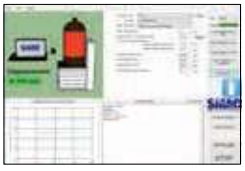
Ejection Control Center: ECC

User configurable Ejection applications. Select and program between 4 types of ejection sequence including soft eject, rapid eject etc. Control velocity for ejection based on customer cycle time requirements. Adjust force to eject based on the weight/mass of the object to eject. Manipulate position to park the actuator based on the program sequence.



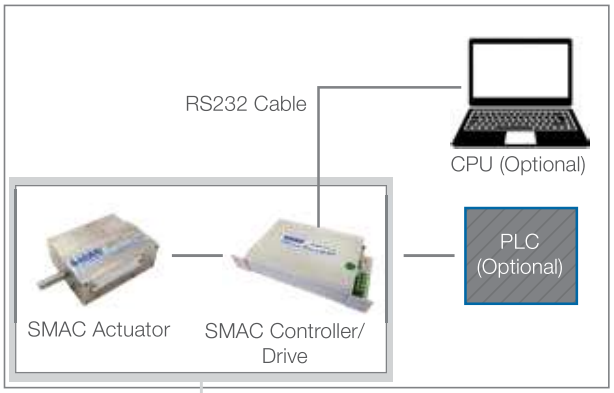
Leak Test Center: LTC

User configurable Leak testing applications: Select and program between two types of leak testing procedure(Velocity and Force). Unique capability of SMAC actuator to soft land on the object and applying force can be programmed using this GUI. Precise monitoring of displacement of the bottle/container/ or any testing sample during leak testing. Adjust the force to be applied on the test object using this software.

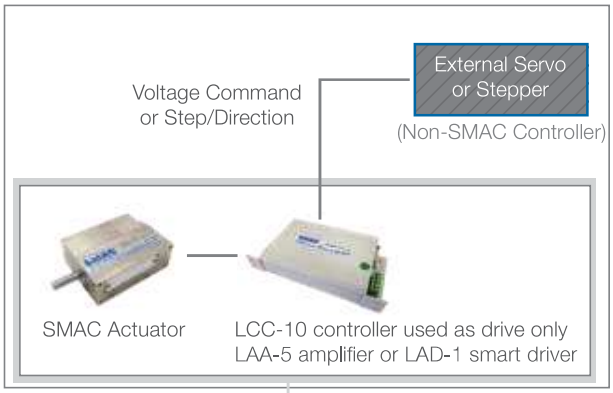


SYSTEM CONFIGURATION

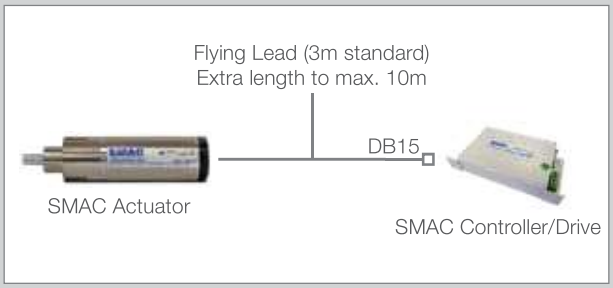
Configuration with SMAC Controllers



Configuration with Non-SMAC Controllers

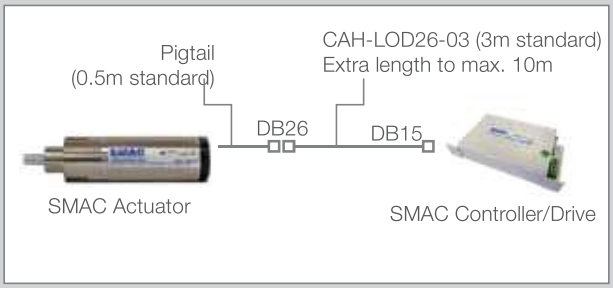


Configuration for Flying Lead Cable

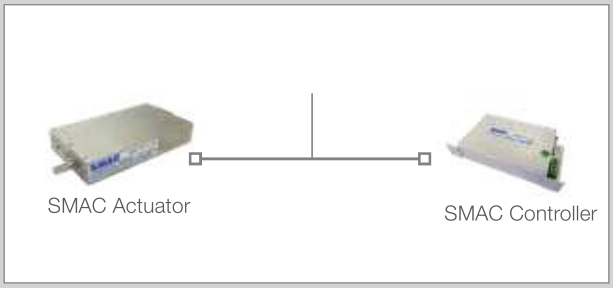


CAL, CBL, CTL, LCA, LCB, LBL, MGR and SLA series

Configuration for Pigtail Cable

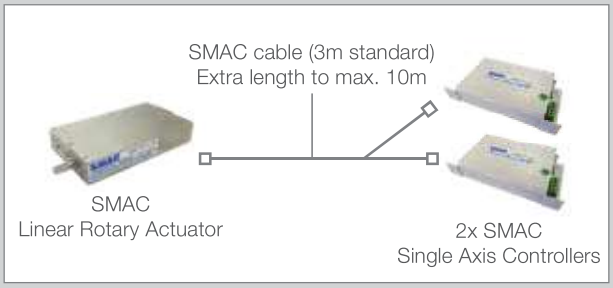


Configuration for SMAC Cable



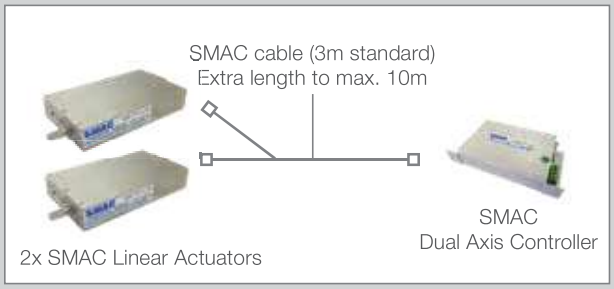
LAL(S), LAR, GRP and LXY series

Configuration with 2 Single Axis Controllers



LAR and LCR series

Configuration with 1 Dual Axis Controller



LAL(S) series

ENCODERS

Optical Encoders

SMAC encoders are made using optical components provided by large volume manufacturers of printers, cameras, cell phones and independent manufacturers of standard mixed signal ASIC semiconductor products used in optical encoders around the world.

We use these high reliability optical components that are made in the millions per year to take advantage of the latest manufacturing technologies used in these fields and the latest design features patented by these suppliers. Technologies include using Interlaced Photo Detector Arrays to better balance the light viewed across the photo sensor array and average imperfections in the code pattern of the scale, LED light intensity auto gain to compensate for LED aging and temperature changes and GUI control of the many features selected in the interpolator and signal conditioning ASIC.

SMAC Advantages

- Reflective and diffractive type encoders allow smaller cross-sections with all components on one side of the scale
- Interlaced optical ASIC's allow reader head mounting tolerance rotation of ±0.2 MM and gap settings of 0.5 to 1.0 MM for easier installation.
- Small size ASIC's allow PCB sizes down to 6 MM wide for tighter fits.
- Integrated Optical ASIC interpolators to 16x for 5 Micron linear encoders and 24,000 cpr, 12 MM diameter rotary encoders.
- 20 Micron pitch Diffractive encoder modules with GUI calibrated ASIC interpolation for resolutions down to 50 Nanometers.
- Very compact. Custom packaging available for OEM
- Cost competitive
- Factory calibrated. User programming available for in field optimization.

Custom Encoders

SMAC will work with you to build custom encoders that fits your project specifications. Please contact us if you don't find that any of our standard products will fill your needs.

LL Series Linear Encoder

The LL linear encoder is a miniature non-contacting high resolution incremental linear encoder, which delivers two count channels in quadrature RS422 output signals. This series is available in 1 and 5 micron resolution.

Features
- Light Source: Light Emitting Diode;
- Light Sensor: Optical ASIC
- Resolution after quadrature: 5 and 1 micron
- Output Format: Differential RS422 line driver output. Two count channels A and B in quadrature with an optional ZR output;
- Quadrature spec.: 90° ± 45° at maximum conditions;
- Rise and Fall Time: 1 µs max., with 1000 pF load;
- Travel length: up to 250mm (special lengths available on request)

SLE-LI Series Linear Encoder

The SLE-LI encoder is a miniature non-contacting high resolution Incremental linear encoder, which delivers two count channels in quadrature RS422 output signals. This series is available in 1, 0.5, and 0.1 micron resolution. 150mm scale length standard.

Features
- Light Source: Light Emitting Diode;
- Light Sensor: AEDR Optical Asic;
- Resolution after quadrature:
- Output Format: Differential RS422 line driver output. Two count channels A and B in quadrature with an optional ZR output;
- Quadrature spec.: 90° ± 22° at maximum conditions;
- Rise and Fall Time: 1mµ max. into 1000 pF load;
- Travel length: up to 264 mm.

SLE-35 Series Linear Encoder

The SLE-35, high resolution linear encoder is similar in mounting to other industry standard enclosed linear encoders. This model is a miniature non-contacting high resolution incremental linear encoder, which delivers two count channels in quadrature (called A and B) as output signals. The two output waveforms are 90 degrees out of phase and indicate both the position and the movement direction: when Channel A leads Channel B, for example, then the movement is from left to right of the scale when viewing the pattern side of the scale. Otherwise, if B leads A, then the displacement is in the opposite direction. This encoder is available in 0.1and 0.05 micron resolution.

Features
- Light Source: Light Emitting Diode;
- Light Sensor: AEDR Optical Asic;
- Resolution after quadrature: 0.1um or 0.05um
- Output Format: Differential RS422 line driver output. Two count channels A and B in quadrature with an optional ZR output;
- Quadrature spec.: 90° ±45° at maximum conditions;
- Rise and Fall Time: 1µs max. into 1000 pF load;
- Travel length: up to 150 mm standard. Please contact us for information about longer lengths.

SRE-30 Series Rotary Encoder

The SRE-30 series, high resolution rotary encoder is similar in mounting to other industry standard enclosed rotary encoders. This model is a miniature non-contacting high-resolution incremental rotary encoder, which delivers two count channels in quadrature (called A and B) as output signals. The two output waveforms are 90 degrees out of phase and indicate both the position and the movement direction: when Channel A leads Channel B, for example, then the movement of the disc is clockwise. Otherwise, if B leads A, then the displacement is in the opposite direction. This encoder is available in 1000, 2000, 4000, 8000 and 16000 CPR resolution.

Features
- Light Source: Light Emitting Diode;
- Light Sensor: Optical Asic;
- Resolution: 1000, 2000, 4000, 8000 or 16000 CPR
- Output Format: Differential RS422 line driver output. Two count channels A and B in quadrature with an optional ZR output;
- Quadrature spec.: 90° ± 45° at maximum conditions;
- Rise and Fall Time: 1 µs max. into 1000 pF load;
- 6mm standard shaft size