选型手册 2020
模块

我们将数字信号
转化为物理运动
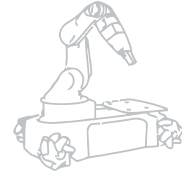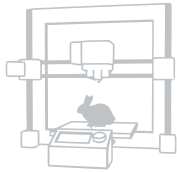
TRINAMIC
MOTION CONTROL

关于我们

拥有数以十年构筑高可靠性嵌入式构架的行业经验

Trinamic是嵌入式电机和运动控制机领域的全球领导者。
我们为我们独特的文化感到自豪,我们的文化集
精密的德国工程,对完美的追求,实用的技术和物理运动于一
身。我们悠久的历史教会了我们如何优化性能,驾驭
小型化,并将关键的电动机特性转变为客户设备的竞争优势。

使用TRINAMIC技术来提升您的产品品质

电动机是日常生活中必不可少的一部分, 近年来, 这些设备的使用量持续上升。中产阶级的不断壮大, 加上家庭自动化程度的提高, 以及家庭周围电动马达驱动的产品数量的增加, 是经济增长的主要动力"

Bryan Turnbough, IHS分析师。

人类全方位实现自动化的趋势导致受控运动系统部署的爆炸式增长。但是只有当数字信息可以转变为完美的物理运动时以前不可能的应用才突然成为可能, 推动了第四次工业革命: 如机器人技术, 物联网, 3D打印机, 假肢, 实验室自动化和轻型电动汽车, 这只是几个例子而已。

然而, 要有效地将数字信息转变为物理运动, 仅仅将数据传输到运动中是不够的。电机控制技术需要简单易用, 需要灵活性以支持不断发展的设备功能, 需要学习能力才能将重复的自动化转变为智能运动, 需要满足不断增正的小型化需求来应对新的应用案例

Trinamic通过将最先进的运动控制简化到1-2-3一样简单来最大程度地满足这些关键要求。我们的开发人员工具包将数十年的运动经验放在工程师的指尖并且我们的硬件构件消除了复杂性, 以确保即使没有运动控制经验的工程师也可以轻松优化电机设计和结果, 以更快地推动创新。

为什么世界上最具前瞻性的公司一再选择Trinamic?

当然, 有些人选择我们是因为我们卓越的产品功能。
但是, 大多数客户选择我们是因为我们专注于运动控制, 因此能够提供深度应用程序知识, 使我们的客户成为市场领导者。

Trinamic带来的创新

在过去的20年中，Trinamic创建了一个于广泛的产品和解决方案组合，该组合专注于将数字信息转化为精确而高效的物理运动-从微步运动到StealthChop™和硬件中的磁场定向控制再到Trinamic自己的集成开发环境。

为了追求完美，Trinamic定期添加新的，创新的运动控制产品和解决方案到他们的产品中。

集成方案通过将运动控制功能和驱动功能集成在单一的器件中。它结合了一个灵活的硬件斜坡发生器用于自动目标位置控制与行业最先进的步进电机驱动功能。

cDriver™

高集成度，高能源效率，和小尺寸，为小型化和可扩展系统提供经济型灵活的解决方案完整的解决方案将经验学习降到最低，同时提供了最佳的性能。

步进电机无传感器力矩测量。StallGuard™提供具有成本效益的实时反馈的负载角，这是世界上第一个在标准步进电机驱动程序中实现的无传感器负载检测的技术。

StallGuard™

StallGuard™不需要原点和限位传感器。这降低了需要精确寻找参考点的应用成本和复杂性。高分辨率的 StallGuard2™反馈技术可以允许持续检测系统状况。

依靠StallGuard2™的负载值，CoolStep™ 技术可以实现无传感器电流随负载动态变化。驱动器总是以最佳的输出电流来驱动电机，因此能够达到节能效果。

CoolStep™

不需要任何传感器，CoolStep™ 消除了对安全余量电流的需求，提升电机性能，避免了堵转和丢步，提高了整个系统的可靠性。

StealthChop™

StealthChop™ 实现对步进电机异常安静的驱动.低速运转的电机会出现磁致现象,这种现象会产生可听见的高频噪音。

基于电流反馈,芯片采用基于电压调制方式调节电流,使电流波动最小化。StealthChop™的应用可以使电机噪音低于10 db,大大低于传统的电流调制方式。

SpreadCycle™

使用 SpreadCycle™,呈现正弦波的微步电流可以一直保持完美的波形,在电流零点处能平滑过零点,没有电流死区。采用 SpreadCycle™的驱动能消除由于电机反电动势带来的电流波形跳动。

步进电机可以实现高速运动,而且运行平稳,不会产生振动。减少了共振,提高了效率,因为没有能量被用在共振上面。

SixPoint™

SixPoint™六点斜坡曲线控制允许更加快速的完成定位,通过在线性轨迹曲线上加入可以自由配置的启动/停止频率以及在高速时候添加一个额外的减加速度。

六点斜坡曲线控制和传统的梯形加减速相比减少了加速阶段产生的抖动。在一些要求高速定位控制场合以及处理一些对晃动敏感的物品或者物体的惯量比较大时,S型正弦曲线轨迹是必须的。

TMCL™

Trinamic Motion Control Language 是一套致力于运动控制的可编程语言。它采用了简单易懂的指令完成定位控制以及设置运动控制的所有参数,加速用户产品开发。

与此同时,它为所有必要的电机控制参数提供了全面的指令集。该指令集由集成开发环境TMCL-IDE支持,它允许将Trinamic产品快速集成到您自己的硬件中去。

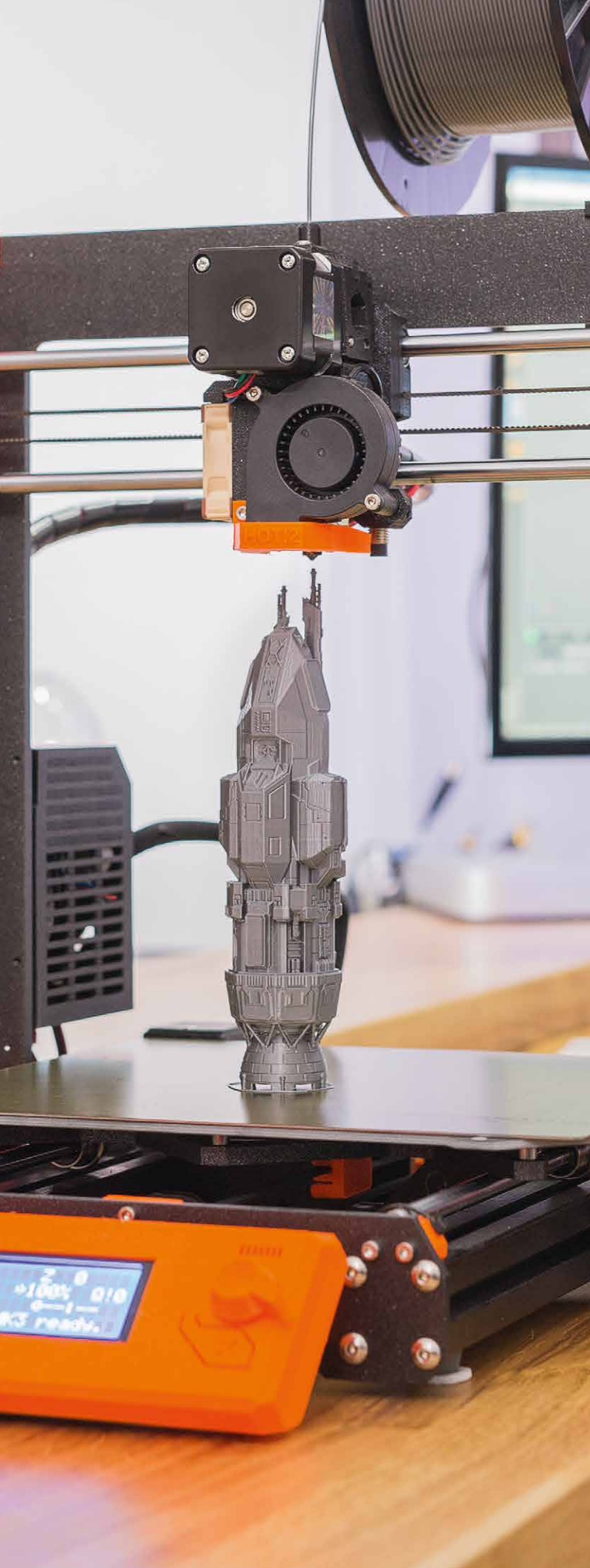得益于平稳，精确和异常静音的电机控制，3D打印已发展成为一项可供世界各地的消费者使用的技术。

微型电机变得无处不在

但是，它们只是我们日常生活中众多电机应用的一小部分。Trinamic凭借行业领先的运动控制与环境无缝融合，为未来的假肢，家庭自动化和便携式设备提供了一流的解决方案。

只要需要可靠定位的应用，Trinamic都可以提供可靠的基于硬件的系统解决方案。

您的应用是什么?

Trinamic的微系统适用于所有需要受控运动的应用。他们的产品为诸如数字制造，物联网，医疗设备，机器人技术和实验室自动化等应用设定了运行标准。

Trinamic使当今的工程师能够快速而可靠地开发出高精度的驱动器，从而可以高效，平稳且安静地工作。

需要自定义解决方案?

只需访问我们的网站，让我们知道您的要求。 我们的工程师将为您设计最佳解决方案。

CUSTOMS.TRINAMIC.COM

单轴步进驱控模块

PRODUCT	TMCM-1210	TMCM-1021	TMCM-1043	TMCM-1140	TMCM-1240	TMCM-1141
Number of axes	1	1	1	1	1	1
Motor type	Stepper	Stepper	Stepper	Stepper	Stepper	Stepper
Phase current (RMS)	0.6A	0.7A/ 1.4A	1.1A	2A	2A	1.1A / 2.0A
Motor supply voltage	7V...30V	9V...28V	9V...28V	9V...28V	10V...30V	9V...28V
Max. microstep resolution	256	256	256	256	256	256
Interface: RS485	✓	✓	-	✓	✓	✓
Interface: CAN	-	-	-	✓	✓	-
Interface: USB	-	-	-	✓	✓	✓
Interface: S/D	-	(GP in)	✓	-	✓	✓
MicroPlyer™ [µSteps]	16 to 256	-	16 to 256	16 to 256	any to 256	16 to 256
Bus protocol	TMCL	TMCL	(TMCL)**	TMCL / CANopen	TMCL / CANopen	TMCL
StallGuard2™	✓	✓	-	✓	✓	✓
CoolStep™	✓	✓	-	✓	✓	✓
SpreadCycle™ chopper	✓	✓	✓	✓	✓	✓
StealthChop™	✓	-	-	-	✓	-
Encoder interface	-	-	-	✓	✓	-
SensOstep™ encoder resolution	4096	1024	-	1024	1024	-
Ramp generator	SixPoint™	trapezoidal	-	trapezoidal	SixPoint™	trapezoidal
Reference inputs	L/R*	HLR*	-	HLR (PU)*	H (PU) LR(I)*	HLR (PU)*
General purpose IN (digital)	1x 5/24V	3x 5/24V	-	3x 5/24V	2x 5/24V	3x 5/24V
General purpose IN (analog)	-	1x 0-6.6V, 12 bit	-	1x 0-10V, 12 bit	1x 0-10V, 12 bit	1x 0-10V, 12 bit
General purpose OUT (digital)	-	2x OD, 100mA	2	1x 5V, 1x OD, 1A	1x OD, 100mA	2x OD, 100mA
Board dimensions	20 x 20mm²	28 x 28mm²	37 x 37mm²	37 x 37mm²	37 x 37mm²	37 x 37mm²
Motor mountable	NEMA 8	NEMA 11	NEMA 17	NEMA 17	NEMA 17	NEMA 17
Product status	active	active	active	active	active	active

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up (programmable) | I = isolated

**parametrization only

TMCM-1241	TMCM-1160	TMCM-1260	TMCM-1161	TMCM-1180	TMCM-1181	PRODUCT
1	1	1	1	1	1	**Number of axes**
Stepper	Stepper	Stepper	Stepper	Stepper	Stepper	**Motor type**
3A	2.8A	6A	2.8A	5.5A	6.4A	**Phase current (RMS)**
10V...30V	9V...51V	12V...54V	10V...30V	18V...55V	11V...28V	**Motor supply voltage**
256	256	256	256	256	256	**Max. microstep resolution**
✓	✓	✓	✓	✓	✓	**Interface: RS485**
✓	✓	✓	-	✓	-	**Interface: CAN**
✓	✓	✓	✓	✓	✓	**Interface: USB**
✓	✓	✓	(GP in)	✓	(GP in)	**Interface: S/D**
any to 256	16 to 256	any to 256	16 to 256	16 to 256	16 to 256	**MicroPlyer™ [μSteps]**
TMCL / CANopen	TMCL / CANopen	TMCL / CANopen	TMCL	TMCL / CANopen	TMCL	**Bus protocol**
✓	✓	✓	✓	✓	✓	**StallGuard2™**
✓	✓	✓	✓	✓	✓	**CoolStep™**
✓	✓	✓	✓	✓	✓	**SpreadCycle™ chopper**
✓	-	✓	-	-	-	**StealthChop™**
✓	✓	✓	-	✓	-	**Encoder interface**
1024	1024	1024	1024	256	1024	**SensOstep™ encoder resolution**
SixPoint™	trapezoidal	SixPoint™	trapezoidal	trapezoidal	trapezoidal	**Ramp generator**
H (PU) LR(I)*	HLR (PU)*	H (PU) LR(I)*	HLR (PU)*	HLR (PU)*	HLR (PU)*	**Reference inputs**
2x 5/24V	3x 5/24V	2x 5/24V	3x 5/24V	3x 5/24V	-	**General purpose IN (digital)**
1x 0-10V, 12 bit	1x 0-10V, 12 bit	1x 0-10V, 12 bit	1x 0-10V, 12 bit	2x 0-10V, 12 bit	2x 0-10V, 12bit	**General purpose IN (analog)**
1x OD, 100mA	2x OD, 1A	1x OD, 100mA	2x OD, 100mA	2x OD, 1A	2x OD, 100mA	**General purpose OUT (digital)**
39 x 39mm²	60 x 60mm²	60 x 60mm²	60 x 60mm²	86 x 86mm²	86 x 86mm²	**Board dimensions**
NEMA 17	NEMA 23/24	NEMA 23/24	NEMA 23/24	NEMA 34	NEMA 34	**Motor mountable**
active	active	active	active	active	active	**Product status**

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up (programmable) | I = isolated

脉冲型/总线型驱动器

PRODUCT	TMCM-1070	TMCM-1270	TMCM-1076	TMCM-1276
Number of axes	1	1	1	1
Motor type	Stepper	Stepper	Stepper	Stepper
Phase current (RMS)	1.2A	1.2A	3A	3A
Motor supply voltage	9V...26V	9V...26V	10V..30V	10V...30V
Max. microstep resolution	256	256	256	256
Interface: RS485	-	-	-	-
Interface: CAN	-	✓	-	✓
Interface: USB	-	-	-	-
Interface: S/D	✓	-	✓	-
MicroPlyer™ [µSteps]	any to 256	-	any to 256	-
Bus protocol	TMCL**	TMCL / CANopen	TMCL**	TMCL / CANopen
StallGuard2™	-	✓	✓	✓
CoolStep™	(✓)	✓	✓	✓
SpreadCycle™ chopper	✓	✓	✓	✓
StealthChop™	✓	✓	✓	✓
Encoder interface	-	✓***	-	-
Ramp generator	-	SixPoint™	-	SixPoint™
Reference inputs	-	HLR*	-	HLR (PU)*
General purpose IN (digital)	-	3x 5V TTL	-	3x 5V TTL
General purpose IN (analog)	-	1x	-	1x
General purpose OUT (digital)	-	-	-	-
Board dimensions	42 x 42mm²	42 x 42mm²	60 x 60mm²	60 x 60mm²
Motor mountable	NEMA 17	NEMA 17	NEMA 23/24	NEMA 23/24
Product status	active	active	active	active

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up

** parametrization only

***encoder or digital input

StepRocker™ 产品线
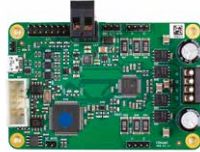
TMCM-1110 StepRocker	TMCM-1111 StepRocker Servo	TMCM-1211 StepRocker	TMCM-1316 StepRocker Servo	PRODUCT
1	1	1	1	**Number of axes**
Stepper	Stepper	Stepper	Stepper	**Motor type**
2.8A	1A, 2.8A	1.2A, 3.1A, 6.0A	1.2A, 3.1A, 6.0A	**Phase current (RMS)**
10V...30V	10V..30V	10V...30V	10V..30V	**Motor supply voltage**
256	256	256	256	**Max. microstep resolution**
✓	✓	✓	✓	**Interface: RS485**
(✓)	(✓)	(✓)	(✓)	**Interface: CAN**
✓	✓	✓	✓	**Interface: USB**
16 to 256	-	any to 256	-	**MicroPlyer™ [µSteps]**
TMCL	TMCL	TMCL	TMCL	**Bus protocol**
✓	✓	✓	✓	**StallGuard2™**
✓	✓	✓	✓	**CoolStep™**
✓	✓	✓	✓	**SpreadCycle™ chopper**
-	-	✓	✓	**StealthChop™**
✓	✓	✓	✓	**Encoder interface**
-	✓	-	✓	**Closed-loop position control**
-	-	-	-	**Field oriented control**
trapezoidal	linear, S-Shaped	SixPoint™	linear, S-Shaped, SixPoint™	**Ramp generator**
3LR (PU)*	HLR (PU)*	HLR (PU)*	HLR (PU)*	**Reference inputs**
3x 5V TTL	3x 5V TTL	3x 5V TTL	3x 5V TTL	**General purpose IN (digital)**
1x 0-10V, 12 bit	1x 0-10V, 12 bit	1x 0-10V, 12 bit	1x 0-10V, 12 bit	**General purpose IN (analog)**
2x OD, 100mA	2x OD, 100mA	2x OD, 100mA	2x OD, 100mA	**General purpose OUT (digital)**
85 x 55mm²	85 x 55mm²	85 x 55mm²	85 x 55mm²	**Board dimensions**
active	active	active	active	**Product status**

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up

多轴总线型驱控器

PRODUCT	TMCM-3110	TMCM-3212	TMCM-3213	TMCM-3214	TMCM-3215	TMCM-3230
Number of axes	3	3	3	3	3	3
Motor type	Stepper	Stepper	Stepper	Stepper	Stepper	Stepper
Phase current (RMS)	2.8A	3A	3A	6.5A	6.5A	1.0A
Motor supply voltage	9V...52V	12V...53V	12V...53V	18V...53V	18V...53V	9V...28.5V
Max. microstep resolution	256	256	256	256	256	256
Interface: RS485	✓	✓	-	✓	-	✓
Interface: CAN	✓	✓	-	✓	-	✓
Interface: USB	✓	✓	✓	✓	✓	✓
Interface: EtherCAT	-	-	✓	-	✓	-
Interface: S/D	3x IN	-	-	-	-	-
MicroPlyer™ [µSteps]	16 to 256	any to 256	any to 256	any to 256	any to 256	any to 256
Bus protocol	TMCL / CANopen	TMCL / CANopen	CoE	TMCL / CANopen	CoE	TMCL / CANopen
StallGuard2™	✓	✓	✓	✓	✓	✓
CoolStep™	✓	✓	✓	✓	✓	✓
SpreadCycle™ chopper	✓	✓	✓	✓	✓	✓
StealthChop™	-	✓	✓	✓	✓	✓
DcStep™	-	✓	✓	✓	✓	-
ABN encoder interface	3	3	3	3	3	-
Ramp generator	trapezoidal	SixPoint™	SixPoint™	SixPoint™	SixPoint™	SixPoint™
Reference inputs	3LR (PU)*	3HLR (PU)*	3HLR (PU)*	3HLR (PU)*	3HLR (PU)*	3LR (PU)*
General purpose IN (digital)	6x 5/24V	4x 5-24V (opt)	4x 5-24V (opt)	4x 5-24V (opt)	4x 5-24V (opt)	8x 5V
General purpose IN (analog)	2x 0-10V, 12 bit	4x 0-10V (opt)	4x 0-10V (opt)	4x 0-10V (opt)	4x 0-10V (opt)	8x 0-5V (opt)
General purpose OUT (digital)	6x OD,100mA + 2x OD,1A	4x OD,1A	4x OD,1A	4x OD,1A	4x OD,1A	8x 5V TTL
Board dimensions	100 x 130mm²	215 x 100mm²	215 x 100mm²	215 x 100mm²	215 x 100mm²	80 x 50mm²
Product status	active	active	active	active	active	active

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up (programmable)

TMCM-6110	TMCM-6210	TMCM-6211	TMCM-6212	TMCM-6213	PRODUCT
6	6	6	6	6	**Number of axes**
Stepper	Stepper	Stepper	Stepper	Stepper	**Motor type**
1.1A	0.7A	0.7A	1.1A	1.1A	**Phase current (RMS)**
9V...28V	10.5V...27V	10.5V...27V	11V...35V	11V...35V	**Motor supply voltage**
256	256	256	256	256	**Max. microstep resolution**
✓	✓	-	✓	-	**Interface: RS485**
✓	✓	-	✓	-	**Interface: CAN**
✓	✓	✓	✓	✓	**Interface: USB**
-	-	✓	-	✓	**Interface: EtherCAT**
-	-	-	-	-	**Interface: S/D**
16 to 256	16 to 256	16 to 256	16 to 256	16 to 256	**MicroPlyer™ [µSteps]**
TMCL	TMCL / CANopen	CoE	TMCL / CANopen	CoE	**Bus protocol**
✓	✓	✓	✓	✓	**StallGuard2™**
✓	✓	✓	✓	✓	**CoolStep™**
✓	✓	✓	✓	✓	**SpreadCycle™ chopper**
-	✓	✓	✓	✓	**StealthChop™**
-	✓	✓	✓	✓	**DcStep™**
-	6	6	6	6	**ABN encoder interface**
trapezoidal	SixPoint™	SixPoint™	SixPoint™	SixPoint™	**Ramp generator**
6LR (PU)*	6HLR (PU)*	6HLR (PU)*	6HLR (PU)*	6HLR (PU)*	**Reference inputs**
6x 5/24V	4x 5-24V (opt)	4x 5-24V (opt)	4x 5-24V (opt)	4x 5-24V (opt)	**General purpose IN (digital)**
2x 0-10V	4x 0-10V (opt)	4x 0-10V (opt)	4x 0-10V (opt)	4x 0-10V (opt)	**General purpose IN (analog)**
6x OD,100mA + 2x OD,1A	4x OD,1A	4x OD,1A	4x OD,1A	4x OD,1A	**General purpose OUT (digital)**
100 x 130mm²	215 x 100mm²	215 x 100mm²	215 x 100mm²	215 x 100mm²	**Board dimensions**
active	active	active	active	active	**Product status**

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up (programmable)

**StealthChop2™

单轴步进伺服驱控器

PRODUCT	TMCM-1310	TMCM-1311
Number of axes	1	1
Motor type	Stepper	Stepper
Phase current (RMS)	3A	3A
Motor supply voltage	9V...51V	9V...51V
Max. microstep resolution	256	256
Interface: RS232	-	-
Interface: RS485	-	✓
Interface: CAN	-	✓
Interface: USB	✓	✓
Interface: EtherCAT	✓	-
Bus protocol	CoE	TMCL / CANopen
StallGuard2™	✓	✓
CoolStep™	✓	✓
SpreadCycle™	✓	✓
StealthChop™	-	-
Field oriented control	✓	✓
Closed-loop position control	✓	✓
Encoder interface	✓	✓
Ramp generator	linear	linear
Reference inputs	LR*	LR*
General purpose IN (digital)	6x 5-24V	6x 5-24V
General purpose IN (analog)	2x 0-10V	2x 0-10V
General purpose OUT (digital)	6x OD, 100mA + 2x OD, 1A	6x OD, 100mA + 2x OD, 1A
Board dimensions	110 x 110mm²	110 x 110mm²
Product status	active	active

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up programmable

多轴步进伺服驱控器

TMCM-3312	TMCM-3313	TMCM-3314	TMCM-3315	TMCM-3351	PRODUCT
3	3	3	3	3	**Number of axes**
Stepper	Stepper	Stepper	Stepper	Stepper	**Motor type**
3A	3A	6.5A	6.5A	3A	**Phase current (RMS)**
18V...53V	18V...53V	18V...53V	18V...53V	11V...28V	**Motor supply voltage**
256	256	256	256	256	**Max. microstep resolution**
-	-	-	-	✓	**Interface: RS232**
✓	-	✓	-	✓	**Interface: RS485**
✓	-	✓	-	✓	**Interface: CAN**
✓	✓	✓	✓	✓	**Interface: USB**
-	✓	-	✓	-	**Interface: EtherCAT**
TMCL / CANopen	CoE	TMCL / CANopen	CoE	TMCL / CANopen	**Bus protocol**
✓	✓	✓	✓	✓	**StallGuard2™**
✓	✓	✓	✓	✓	**CoolStep™**
✓	✓	✓	✓	✓	**SpreadCycle™**
✓	✓	✓	✓	✓	**StealthChop™**
-	-	-	-	-	**Field oriented control**
✓	✓	✓	✓	✓	**Closed-loop position control**
3	3	3	3	3	**ABN encoder interface**
SixPoint™, S-Shaped	SixPoint™, S-Shaped	SixPoint™, S-Shaped	SixPoint™, S-Shaped	SixPoint™, S-Shaped	**Ramp generator**
3HLR (PU)*	3HLR (PU)*	3HLR (PU)*	3HLR (PU)*	3LR*	**Reference inputs**
4x 5-24V (opt)	4x 5-24V (opt)	4x 5-24V (opt)	4x 5-24V (opt)	8x 5-24V	**General purpose IN (digital)**
4x 0-10V (opt)	4x 0-10V (opt)	4x 0-10V (opt)	4x 0-10V (opt)	4x 3.3V / 10V	**General purpose IN (analog)**
4x OD, 1A	4x OD, 1A	4x OD, 500mA	4x OD, 500mA	6x OD, 100mA + 2x OD, 1A	**General purpose OUT (digital)**
215 x 100mm²	215 x 100mm²	280 x 100mm²	280 x 100mm²	160 x 100mm²	**Board dimensions**
active	active	active	active	active	**Product status**

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up

单轴直流无刷系统

PRODUCT	TMCM-1630-2C TMCM-1630-4U	TMCM-1633
Number of axes	1	1
Motor type	BLDC/PMSM	BLDC/PMSM
Motor supply voltage	15V...48V	15V...48V
Continuous output [W]	150W...300W	150W...300W
Rated phase current (RMS)	10A	10A
Interface: RS232	✓	✓
Interface: RS485	- ✓	-
Interface: CAN	✓	✓
Interface: USB	- ✓	-
Interface: S/D	-	-
Interface: EtherCAT	-	-
Bus protocol	TMCL	CANopen
Field oriented control	✓	✓
Current control	✓	✓
Velocity control	✓	✓
Position control	✓	✓
Reference inputs	HLR*	HLR*
General purpose IN (digital)	2x 24V	2x 24V
General purpose IN (analog)	2x 10V	2x 10V
General purpose OUT (digital)	3x OD	3x OD
Hall interface	✓	✓
Encoder interface	✓	✓
Ramp generator	trapezoidal	trapezoidal
Board dimensions	50 x 92mm²	50 x 92mm²
Product status	active	active

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up

单轴直流无刷伺服系统

TMCM-1640

	PRODUCT
1	**Number of axes**
BLDC/PMSM	**Motor type**
15V...28.5V	**Motor supply voltage**
100W	**Continuous output**
5A	**Rated phase current (RMS)**
-	**Interface: RS232**
✓	**Interface: RS485**
-	**Interface: CAN**
✓	**Interface: USB**
-	**Interface: S/D**
-	**Interface: EtherCAT**
TMCL	**Bus protocol**
✓	**Field oriented control**
✓	**Current control**
✓	**Velocity control**
✓	**Position control**
HLR*	**Reference inputs**
2x 24V	**General purpose IN (digital)**
1x 10V	**General purpose IN (analog)**
1x OD	**General purpose OUT (digital)**
✓	**Hall interface**
✓	**Encoder interface**
trapezoidal	**Ramp generator**
42 x 42mm²	**Board dimensions**
active	**Product status**

*H = HOME | LR = STOP_L + STOP_R | PU = internal pull-up

高分辨率编码器

PRODUCT	TMCS-20-4-8192-AT-01	TMCS-28-5-10000-AT-01 TMCS-28-6.35-10000-AT-01	TMCS-28-5-1024-AT-01 TMCS-28-6.35-1024-AT-01	TMCS-40-6.35-10000-AT-01
Housing diameter	20mm	28mm	28mm	40mm
For shaft diameter	4mm	5mm 6.35mm	5mm 6.35mm	6.35mm
Resolution [lines]	8.192	10.000	1.024	10.000
Resolution [increments]	32.768	40.000	4.096	40.000
Interface	ABN	ABN	ABN	ABN
Level	TTL	TTL	TTL	TTL
ABN incremental	✓	✓	✓	✓
Max. rpm	6000 rpm	6000 rpm	6000 rpm	7500 rpm
Max. frequency	1500 kHz	1500 kHz	1500 kHz	1500 kHz
Product status	active	active	active	active
Evaluation	TMCS-20-KIT	TMCS-28-KIT	TMCS-28-4096-KIT	TMCS-40-KIT

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