TG Motion

version 4

Hardware

operation manual

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Revision History

date	version	revision
31 July 2017	1.0	Initial release

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1. Hardware

1.1 Hardware solution description

An industrial PC, which can communicate with up to 256 peripheries via EtherCAT, makes the heart of the hardware solution. The peripheries most frequently met are the servo drives, I/O units or strain gauges.

The user interface is managed by means of an operator panel. Classical control methods using a mouse, a keyboard, or tablet, can also be used.

The PC can communicate with its environment from Windows applications through PROFINET, Ethernet, or Internet.

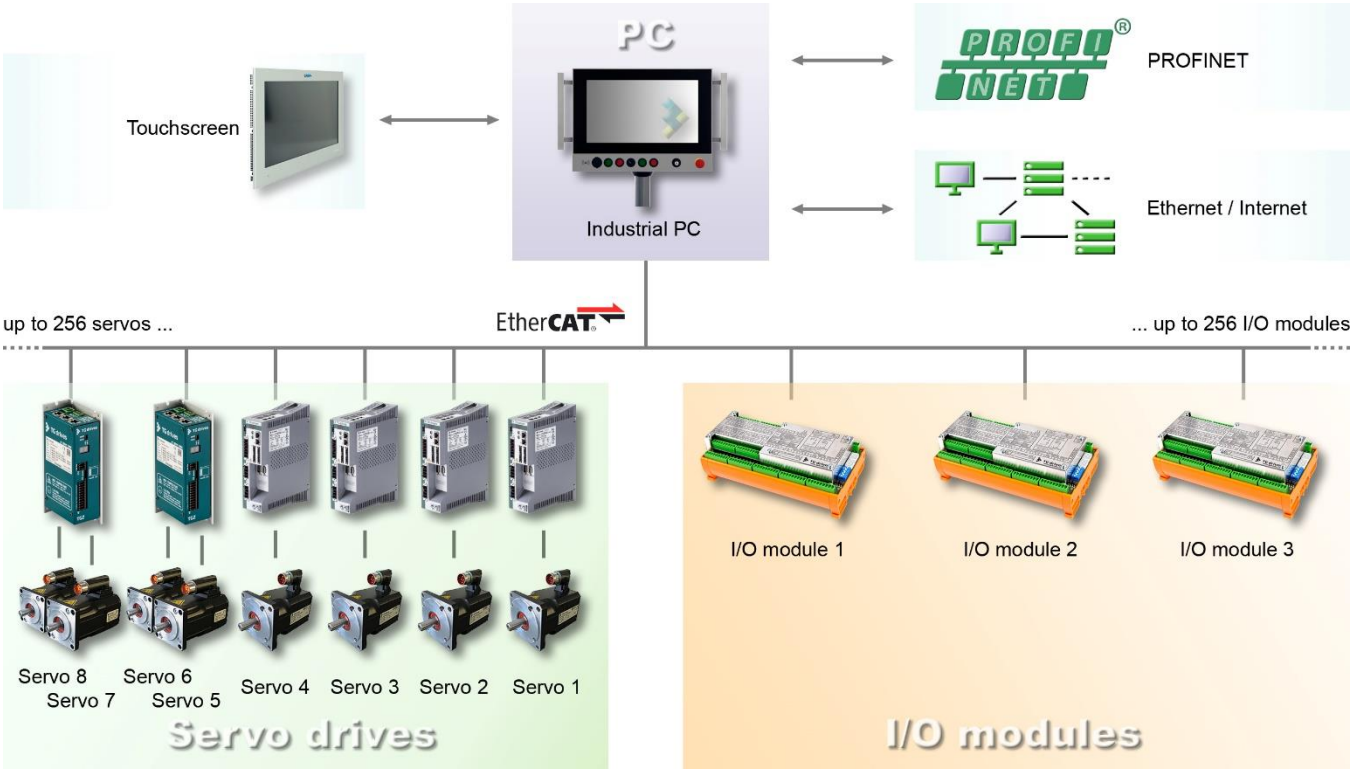

Fig. Hardware solution of TG Motion

With regard to the fact that the system is running on a PC with a Windows operating system, all connectivity options of this system can be used.

1.2 PC – computer

TG Drives delivers comprehensive systems with a PC-based control unit. The PC hardware requirements are given by the operating system. **TG Motion** system cooperates with Windows operating system (OS).

Supported operating systems: Windows XP Embedded
Windows 7
Windows Embedded Standard 7
Windows 8.1 (x64)
Windows Embedded Standard 8.1 (x64)

Among the mostly required interfaces there are USB2 or USB3 and a network card for connecting to EtherCAT. Supported network cards are listed in the table below.

Supported and tested network cards

manufacturer	driver	description	trade name	slot	test	support
Intel	Rt8255x	82557/8/9/0/1 Intel PRO/100 S Server Adapter (82550EY)		PCI	yes	yes
	Rt8255x	82559 ER (8255xER/IT) Intel Fast Ethernet		PCI	no	yes
Intel	RtE1000	Intel 82566 MM Gigabit Ethernet Controller		PCI	yes	no
	RtE1000	Intel 82566 DM Gigabit Ethernet Controller		PCI	no	no
	RtE1000	Intel 82574L Gigabit Ethernet Controller		PCI	yes	yes
Intel	RtIGB	I210 T1 Ethernet Server Adapter		PCI	yes	yes
	RtIGB	I350 10/100/1000 Mb/s Ethernet Controller, x4 PCIe, Copper		PCI	no	yes
Realtek	RtRtl81x9	8139 8100 8169 8110 GigaFast EE110-AXP, 8139(c) (non plus)	TP-Link: TF-3239DL	PCI	yes	yes
	RtRtl81x9	GigaFast GE1000-AXP 8169		PCI	yes	yes
	RtRtl81x8	RTL8168/8111(B, C, CP, D, DP)	TP-Link: TG-3468	PCIe	yes	yes

__TG Motion__ could also be run on ordinary PCs. However, the comprehensive systems, which are delivered by __TG Drives__, do not prefer this variant.

1.3 Servo drives

TG Motion, which is running on an industrial PC, can separately communicate – via EtherCAT interface – with as many as 256 servo drives. It can read their positions, send the required positions, read input data and set outputs (provided that they are available on the servo amplifiers). In the case of multi-axis servo drives, one servo amplifier can control two or more axes. See Chapter Servo structure.

Supported and tested servo drive types

manufacturer	description	test	support
Seidel	TGP PowerStage	yes	yes
Danaher	ServoStar S300	yes	yes
	ServoStar S700	yes	yes
	AKD	yes	yes
TG Drives	TGZ-D	yes	yes

1.4 I/O units

TG Motion, which is running on an industrial PC, can communicate – via EtherCAT interface – separately with as many as 256 input/output units. It can read analog as well as digital input data and set analog as well as digital outputs, or, if need be, read strain gauge data.

Supported and tested I/O unit types

manufacturer	description		test	support
TG Drives	DIO Module (old)		yes	yes
	DIO Module		yes	yes
	Strain gauge (old)		yes	yes
	Strain gauge		yes	yes
B&R	X20BC00G3 – Coupler		yes	yes
	X20DI9371 – 12× Digital Input	24 V (0.2 ms)	yes	yes
	X20DO9322 – 12× Digital Output	24 V (0.5 A for a channel)	yes	yes
	X20PS9400 – Power Supply	24 V (max. 10 A)	yes	yes
	X20PS9402 – Power Supply	24 V (max. 10 A)	yes	yes
	X20PS2100 – Power Supply	24 V (max. 10 A)	yes	yes
	X20AI1744 – 1× Full bridge Input	(24 bit, 5 kHz)	yes	yes
	X20AI2622 – 2× Analog Input	±10 V or 0–20 mA (13 bit, 300 µs)	yes	yes
	X20AI4632 – 4× Analog Input	±10 V or 0–20 mA (16 bit, 50 µs)	yes	yes
	X20AO2622 – 2× Analog Output	±10 V or 0–20 mA (13 bit, 200 µs)	yes	yes
	X20AO4622 – 4× Analog Output	±10 V or 0–20 mA (13 bit, 300 µs)	yes	yes
	X20AO4632 – 4× Analog Output	±10 V or 0–20 mA (16 bit, 50 µs)	yes	yes
	X20DC2395 – 2× PWM Output	24 V (1 Hz – 24 kHz)	yes	yes
Beckhoff	BK1120 – Coupler		yes	yes
	ET1100 chipset		yes	yes
	KL3404 – 4× Analog Input	−10 V to 10 V (12 bit, 2 ms)	no	yes
	KL3464 – 4× Analog Input	0–10 V (12 bit, 2 ms)	yes	yes
	KL3408 – 8× Analog Input	−10 V to 10 V (12 bit, 4 ms)	no	yes
	KL3468 – 8× Analog Input	0–10 V (12 bit, 4 ms)	no	yes
	KL3061 – 1× Analog Input	0–10 V (12 bit, 1 ms)	yes	yes
	KL3062 – 2× Analog Input	0–10 V (12 bit, 2 ms)	no	yes
	KL4001 – 1× Analog Output	0–10 V (12 bit, 1.5 ms)	yes	yes
	KL4002 – 2× Analog Output	0–10 V (12 bit, 1.5 ms)	yes	yes
	All simple digital terminals, such as:			
	KL1418 – 8× Digital Input	24 V (0.2 ms)	yes	yes
	KL2408 – 8× Digital Output	24 V (0.5 A for a channel)	yes	yes
Beckhoff	EK1100 – Coupler		yes	yes
	EL1008 – 8× Digital Input	24 V (3.0 ms)	yes	yes
	EL2008 – 8× Digital Output	24 V (0.5 A for a channel)	yes	yes
Festo	CPX-FB38	+ Digital Input, Digital Output, …	yes	yes

1.5 External communication

Windows operating system is running on the industrial PC. Therefore, all communication types offered by this OS are available to the user. Windows application can therefore communicate through PROFINET, Ethernet or Internet.

TG Motion offers the communication with other systems by means of CAN bus.

*The communication of **TG Motion** through CAN runs independently to EtherCAT communication.*

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