Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Sensor technology rotary | Sensor technology linear | Drive technology | Systems

TR-Electronic - Your partner in the world of automation

Extract from our product range

TR ELECTRONIC

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR-Electronic –
Your partner in automation

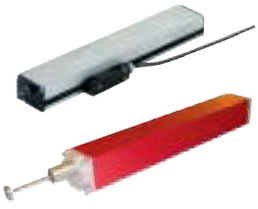
Programmable absolute fieldbus encoders

The standard in automation technology, available for all commercial fieldbusses, such as Profibus, Interbus, CANopen, DeviceNet and Industrial Ethernet.

plus, of course, the standard range of TR
mechanical, interface and functional options

Linear absolute displacement sensors

The compact class for linear absolute measurement. Directly bus capable, suitable for harsh environmental conditions and for installation in hydraulic cylinders



Absolute high resolution linear measurement systems

Linear measurement with absolute, sub-micron resolution without referencing

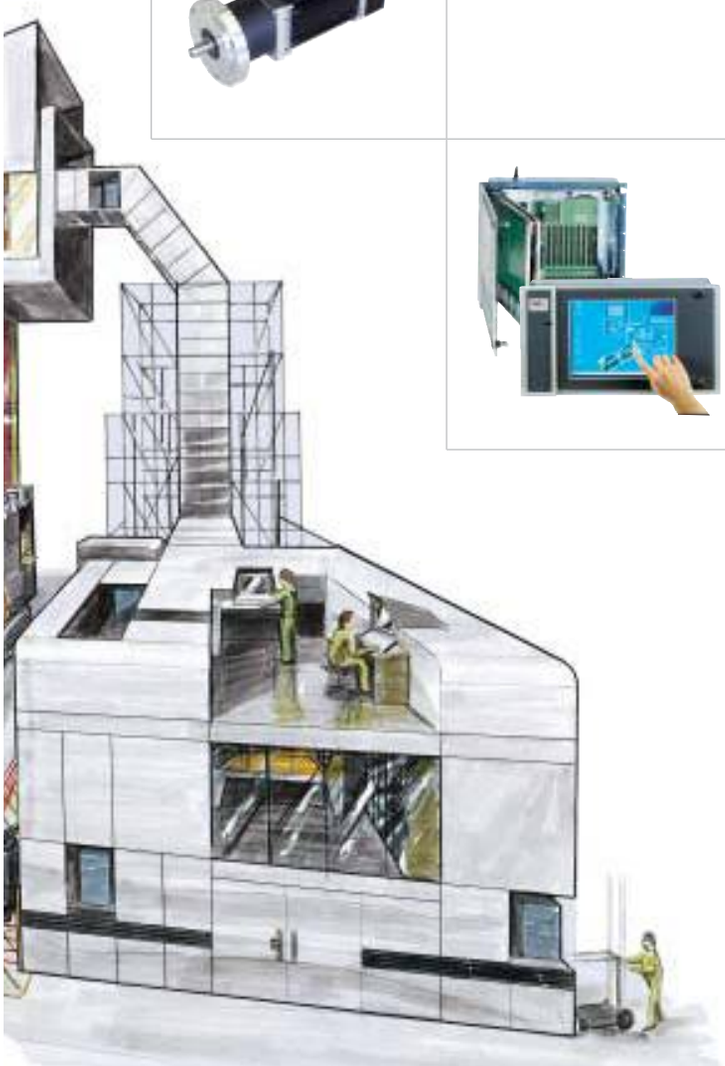
Incremental encoders

from 35 mm external diameter up to 55 mm hollow shaft
- we always have a solution !

LASER-distance measuring systems

Absolute and wear-free measurement of distances up to 200 m via SSI or fieldbus

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com



Intelligent positioning drive

Absolute positioning directly via fieldbus

Integrated - motor, power amplified position control-loop controller, absolute encoder, PLC functions and fieldbus interface.

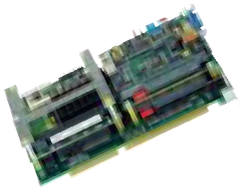
Heavy-duty industrial PC

Double shock proof mounted housing isolates the electronics from vibration, while front access (MIPC) simplifies configuration and start up.

Choose from our wide selection of housings.

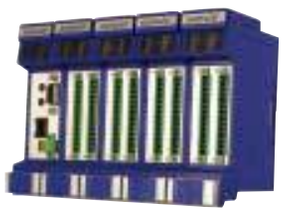
Motor feeback systems

Feedback encoder for modern positioning drives. Optionally integrated or directly mounted on the drive shaft via hollow shaft.



SPC - The PLC for PC

Turns every PC into an efficient PLC under S5/S7 or IEC 1131 protocols. Combines the comfort of PC control with the safety of a seperate processor for PLC tasks.



@ctiveIO - more than fieldbus modules

Modular, rugged fieldbus node system

I/O-node, small-scale PLC, decentralized axis controller, high performance cam controller, DIN-rail mounted industrial PC... with commercial fieldbusses such as, Profibus-DP, CANopen, DeviceNet, LightBus ... and ETHERNET as an option!

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

The modular range of encoders

Absolute rotary and linear measurement technology has represented TR-Electronic's main business for more than twenty years. Right from the beginning we were your partner for custom solutions. In the following, we want to introduce you to our modular system for absolute encoders which, we're confident, contains a suitable sensor for your automation task.

Types

C Compact encoder

The industrial standard for encoders

The traditional type but at the same time extremely flexible. As a solid shaft encoder or also in different versions with hollow, blind shaft or integrated coupling respectively.

Sizes: 58 mm and 65 mm also 100 mm for special connections.

F Feedback encoder

The compact drive solution

Due to its minimal depth, our feedback encoder is especially suitable for installation on drives - a fact that influenced its design as a hollow shaft encoder.

Q "Q-bic" encoder

Hollow shaft flexibility

The cubic design offers space for more - whether the 20 mm hollow shaft or the over sized connector panel which can accept two connectors either for redundancy or simultaneous output of commutation, SSI and fieldbus signals.

Resolution

E Our standard resolution

13 bit (programmable) and as a single or multi-turn encoder, "E" resolution meets the requirements of most applications in industrial automation. The choice of interfaces available and numerous other options enable particular and individual solutions.

X Specialist for specialities

Probably the only device available on the market with programmable sine/cosine output signal (each resolution up to 32,768 pulses).
In combination with the 17 bit absolute signal, unlimited possibilities are created eg. gearless drives, safety applications...

O High resolution for industry

Up to 17 bit/revolution (programmable) solves almost every industrial measurement problem. Of course, also available as a multi-turn encoder.

M

Where only limited demands on resolution, accuracy and interface are required, cost effective "M" series encoders are available.

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Shaft versions

V Solid shaft

Actually, so ordinary that there's nothing much to write about -
but we have shafts with flats, with or without keys in both US and metric dimensions.

H Hollow shaft

With or without key/slot, up to 20 mm diameter

S Blind shaft

In contrast to hollow shafts, a blind shaft has the advantage of only one opening.
Therefore it is generally more suitable for high rotation speeds.

K Integrated coupling

Combines torsion resistant mounting of a solid shaft encoder with the
compact design of a blind shaft. Vibrations and shaft eccentricity are balanced by
a cross coupling element made of plastic.

Only the article number exactly identifies a specific encoder with all options and type details. Therefore the article number is essential for availability and compatibility.

Options and combinations not shown on the following pages may be possible, on request !

You can find more detailed information in the respective encoder brochures CE, XE... as well as in the corresponding data sheets.

The types shown do not state anything about availability and detailed design options. Your local sales representative will give you that information.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Absolute rotary encoders

C Compact encoder	F Feedback encoder	Q "Q-bic" encoder	
E 13 bit abs., 4096 inc. 4096 / 32768 revolutions	O 17 bit abs., 4096 inc. 4096 / 32768 revolutions	X 17 bit abs., 32768 inc. 65536 revolutions	M 9 bit abs., 8192 inc. 32768 revolutions

The industrial standard for absolute rotary and position measurement

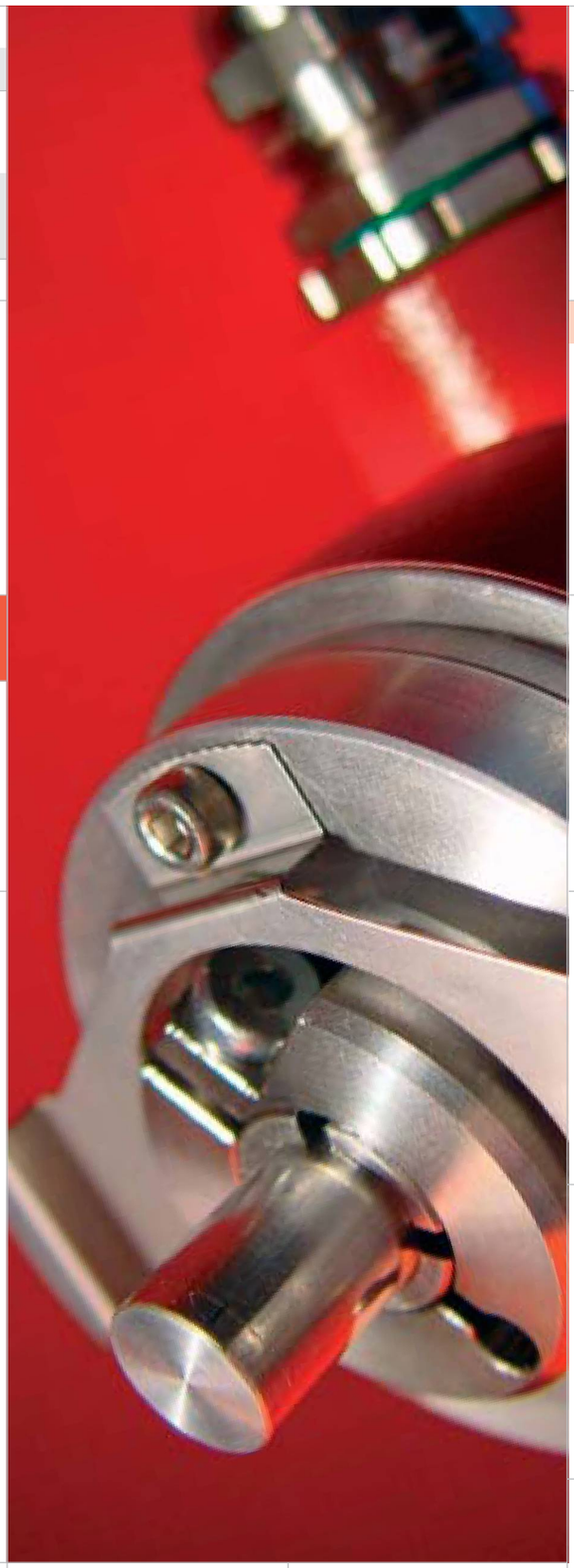
Absolute resolution / revolution:	13 bit, programmable
Number of revolutions:	single turn or
	multi turn 4096, 32768 as an option
Incremental resolutions available:	512, 1024, 2048, 4096
	digital or SIN/COS, separate resolution track

Solid shaft CE 58	Blind shaft CS 58	Hollow shaft CH 58	Integrated coupling CK 58
			

Size:	58 mm
Connectivity:	Radial connector, radial cable gland
	Axial connector, axial cable gland (not for hollow shaft)
	Radial fieldbus end-cap (for Profibus: illuminated address display, externally viewable)
Interfaces:	
single turn	Parallel, SSI, ISI, programmable incremental interface (digital) INC
	Option: A, B (hardware incremental signal)
multi turn	SSI, ISI
	Profibus (PNO class 2), CAN DeviceNet, CANopen,
	AS-i (not for hollow shaft)
	Option: A, B (digital or SIN/COS) (not for fieldbus devices)
Programmability:	devices with direct interface (SSI, ISI..): via PC, TR WINProg
	devices with fieldbus: via fieldbus

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com



Absolute resolution / revolution:	13 bit, programmable
Number of revolutions:	single turn or multi turn 4096

Solid shaft CE 65	Integrated coupling CK 65
	

Size:	65 mm
Connectivity:	Radial connector, radial cable gland Axial connector, axial cable gland Fieldbus end-cap
Interfaces:	
single turn	Parallel, camshaft gear, tool changer, SSI, ISI, SSI+analog (16 bit) Profibus, Interbus, CANopen, DeviceNet, CAN, FO Option: A, B
multi turn	Parallel, CAM controller, tool changer, SSI, ISI, SSI+analog (16 bit) Profibus, Interbus, CANopen, DeviceNet, CAN, FO, FIPIO, new: EtherCAT, Powerlink Option: A, B
Programmability:	via PC or fieldbus

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Absolute rotary encoders

C Compact encoder	F Feedback encoder	Q "Q-bic" encoder		
E 13 bit abs., 4096 inc. 4096 / 32768 revolutions	O 17 bit abs., 4096 inc. 4096 / 32768 revolutions	X 17 bit abs., 32768 inc. 65536 revolutions	M 9 bit abs., 8192 inc. 32768 revolutions	

For higher demands on resolution

Absolute resolution / revolution:	17 bit, programmable
Number of revolutions:	single turn or
	multi turn 4096, 32768 as an option
Incremental resolutions available:	512, 1024, 2048, 4096
	digital or SIN/COS, separate resolution track

Solid shaft COV 58	Blind shaft COS 58	Hollow shaft COH 58	Integrated coupling COK 58
			

Size:	58 mm
Connectivity:	Radial connector, radial cable gland
	Axial connector, axial cable gland (not for hollow shaft)
	Radial fieldbus end-cap (for Profibus: illuminated address display, externally viewable)
Interfaces:	
single turn	Parallel, SSI, ISI, programmable incremental interface (digital) INC
	Option: A, B (hardware incremental signal)
multi turn	SSI, ISI
	Profibus (PNO class 2), CAN DeviceNet, CANopen,
	AS-i (not for hollow shaft)
	Option: A, B (digital or SIN/COS) (not for fieldbus devices)
Programmability:	devices with direct interface (SSI, ISI..): via PC, TR WINProg
	devices with fieldbus: via fieldbus

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

C Compact encoder	F Feedback encoder	Q "Q-bic" encoder
E 13 bit abs., 4096 inc. 4096 / 32768 revolutions	O 17 bit abs., 4096 inc. 4096 / 32768 revolutions	**X** 17 bit abs., 32768 inc. 65536 revolutions

The specialist for particular demands

Absolute resolution / revolution:	17 bit, programmable
Number of revolutions:	single turn or
	multi turn 65536
Programmable SIN/COS:	up to 32768 pulses / revolution

Solid shaft XE 65	Integrated coupling XK 65	Blind shaft XS 65
		

Size:	65 mm
Connectivity:	Radial connector, radial cable gland
	Axial connector, axial cable gland
	Fieldbus end-cap
Interfaces:	
single turn	Parallel, SSI, ISI, SIN/COS (programmable)
	Option: A, B
multi turn	SSI, ISI, SIN/COS (programmable)
	Option: A, B
Programmability:	via PC, TR WINProg

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Absolute rotary encoders

F Feedback encoder

Q "Q-bic" encoder

E 13 bit abs., 4096 inc.
4096 / 32768 revolutions

O 17 bit abs., 4096 inc.
4096 / 32768 revolutions

X 17 bit abs., 32768 inc.
65536 revolutions

Open encoders for drive-feedback applications

Resolution per selected resolution series ("E" 13 bit, "O" 15/17 bit with programmable SIN/COS)

Integrated hollow shaft

Please note, the devices featured here are only examples of possible configurations.

Encoders of this type can be customized according to your requirements !

	Hollow shaft FEH 58	Hollow shaft FOH 58	Hollow shaft FXH 70
			
Size:	58 mm		70 mm
Connectivity:	cable gland		cable gland
Interfaces:			
single / multi turn	Parallel, SSI, ISI, programmable		Parallel, SSI, ISI,
	incremental interface (digital) INC		programmable SIN/COS
	Profibus, CANopen, DeviceNet		
Option:	A, B (digital or SIN/COS)		A, B
Programmability:	via PC, TR WINProg		via PC, TR WINProg

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

H Hardware encoder

E
13 bit abs.,
not programmable

High resolution, streamlined signal processing

With our basic CE 58 you get the full "E" resolution as a parallel single turn encoder.

Resolution is not user programmable and is factory pre-set.

The direction of rotation, via the signal lines, or switched between pre-set code, can be changed according to the specifications chosen.

Solid shaft
HEV 58

Size: 58 mm

For mechanical specifications you can choose between

ZB50 flange and 6 mm shaft or

ZB36 flange and 10 mm shaft

Standard specifications:

Steps / revolution: 4096

Supply: output level 11... 27 V DC or 5 V DC

up to 17 bit output (incl. signal bit), push pull

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Absolute rotary encoders

C Compact encoder | F Feedback encoder | Q "Q-bic" encoder

E 13 bit abs., 4096 inc.
4096 / 32768 revolutions

O 17 bit abs., 4096 inc.
4096 / 32768 revolutions

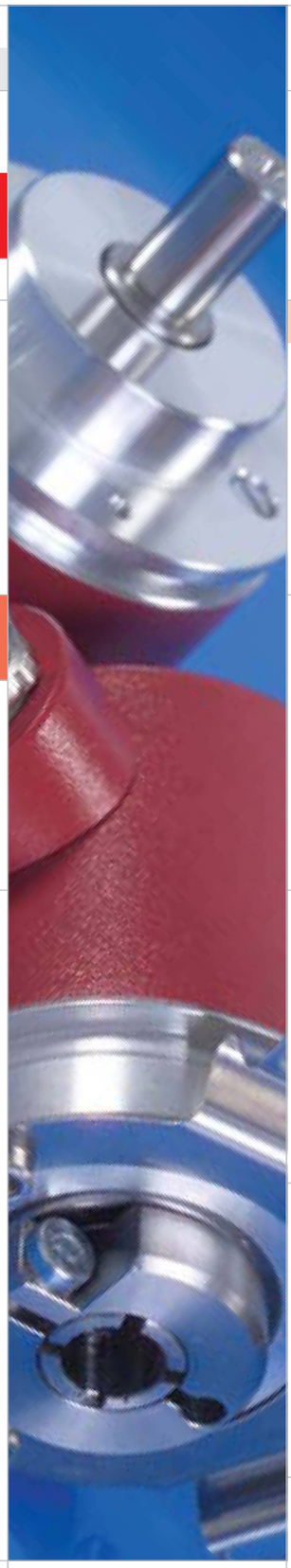
	For special hollow shaft applications	**For special hollow shaft applications with high resolution**
Absolute resolution / revolution:	13 bit, programmable	15 bit, programmable
Number of revolutions:	single turn or multi turn 4096, opt. 32768	single turn or multi turn 4096, opt. 32768
Incremental resolutions available:	512, 1024, 2048, 4096 (A, B additional to the chosen absolute interface)	512, 1024, 2048, 4096 (A, B additional to the chosen absolute interface)

Hollow shaft QEH 65	Hollow shaft QEH 80	Hollow shaft QOH 65	Hollow shaft QOH 80
			

	QEH 65 / QEH 80	QOH 65 / QOH 80
Size:	65 mm or 80 mm	65 mm or 80 mm
Shaft diameter:	max. 20 mm	max. 20 mm
Connectivity:	Radial connector, radial cable gland Radial fieldbus end-cap QEH 65: (for Profibus: **address display, externally viewable**)	Radial connector, radial cable gland Radial fieldbus end-cap QOH 65: (for Profibus: **address display, externally viewable**)
Interfaces:		
single turn	Parallel, SSI, ISI, programmable incremental interface (digital) INC Option: A, B (hardware incremental signal)	Parallel, SSI, ISI, programmable incremental interface (digital) INC Option: A, B (hardware incremental signal)
multi turn	SSI, ISI Profibus (PNO class 2), CAN DeviceNet, CANopen Option: A, B (hardware incremental signal)	SSI, ISI Profibus (PNO class 2), CAN DeviceNet, CANopen Option: A, B (hardware incremental signal)
Programmability:	devices with direct interface (SSI, ISI..): PC, TR WINProg devices with fieldbus: via fieldbus	devices with direct interface (SSI, ISI..): PC, TR WINProg devices with fieldbus: via fieldbus

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com



X		
17 bit abs., 32768 inc. 65536 revolutions	Special types	
Programmable Sinusoidal up to 32768 pulses / revolution **with large hollow shaft** Absolute resolution / revolution 17 bit, programmable single turn or multi turn 65536 revolutions	**Encoder for manual operation with display** Absolute resolution / revolution 6 bit multi turn 65536 revolutions	
Hollow shaft XH 80	**Encoder with display MG 75**	**Hollow shaft ZH 81**
		
Size: 80 mm Connectivity: connector, cable gland Interfaces: single turn SSI, ISI, SIN/COS (programmable) Option: A, B multi turn SSI, ISI, SIN/COS (programmable) Option: A, B Programmability: PC, TR WINProg	Size: 75 mm Hollow shaft: 20 mm Interfaces: asynchronous serial interface (RS 485) with customized protocol up to 32 encoders on one bus The MG 75 was designed as an electronic support for the adjustment of printing, wood working and card-board processing machines. The machine control system communicates the new destination value, the encoder calculates the difference and the correct direction of rotation.	Size: 80 mm Connectivity: connector, cable gland Interfaces: multi turn SSI, ISI, commutation Profibus Interbus-S Programmability: PC, EPROG

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Incremental rotary encoders

	ZI 58	IE 58	IH 58
	programmable incremental encoder	hardware incremental encoder with solid shaft	hardware incremental encoder with hollow shaft
Variations	also as hollow shaft device or with integrated coupling		
			
Maximum resolution	2 - 32768 pulses / revolution	10000 pulses / revolution	
Programmability	via PC EPROG		
Interfaces available	A, A neg. - B, B neg. - Z, Z neg. (digital signals) line driver or push pull	A, A neg. - B, B neg. - Z, Z neg. digital or SIN/COS line driver or push pull	
Shaft diameter	solid shaft 6, 10, 12 mm		hollow shaft 8, 10, 12 mm
Supply	11... 27 V DC	11... 27 V DC 5 V DC	
Maximum rotation	12 000 / min		6 000 / min
Protection class (DIN 40 050)	IP 65	up to IP 65, accord. to specifications	up to IP 54, accord. to specifications
Operating temperature	-20... +70 °C		
General description	Programmable incremental encoder solves the storage problem of multiple fixed disk encoders with different resolutions. You determine the encoder's resolution via software - even after installation.	The incremental encoder, IE 58, is the standard incremental encoder solution. One size (58 mm) is available with all mechanical variations (hollow shaft, blind shaft, solid shaft, integrated coupling).	
Devices shown are a selection from our product range			

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

	IK 58	IS 58	IH 120
	hardware incremental encoder with integrated coupling	hardware incremental encoder with blind shaft	hardware incremental encoder with especially large hollow shaft diameter of 55 mm
			
	10000 pulses / revolution		1024, 2500, 3600, 10000 pulses / revolution, others o.r.
	A, A neg. - B, B neg. - Z, Z neg. digital or SIN/COS line driver or push pull		
	Integrated coupling with mounting flange as desired	Hollow shaft 8, 10, 12 mm	Hollow shaft up to 55 mm
	11... 27 V DC 5 V DC		
	12 000 / min		4 000 / min
	IP 65		up to IP 54, accord. to specifications
	-20... +70 °C		-20... +80 °C

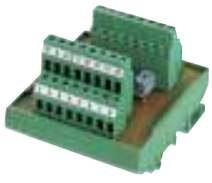
Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Electric accessories

Programming adapter
Connects the device to the PC. Changes signals from RS 232 to encoder programming interface and is electrically isolated. TR-Nr. 490-00301
We suggest the use in conjunction with one of our switch cabinet modules.
USB to encoder conversion on request.

SSI - parallel converter PU 10
Converts absolute position and CAM signals from SSI interface to parallel output bits with max. 32 bit.
TR-Nr. 491-00002

SSI-display ADP 200
Displays absolute position information. Available as both single and double channel version. With the double channel version, positions can be shown separately, alternating or the difference/sum of both.
Programmable with TR-WINprog via IrDA adapter.



Switch cabinet module
The perfect aid for transparent encoder cabling.
Correct grounding of signal wires and easy connection to our programming adapter.
Module 15/2 (SSI + programming wires) TR-Nr: 490-00105
Module 6/1 (only programming wires) TR-Nr: 490-00101

Pulse divider for incremental encoders
For incremental encoder signal processing (and incremental tracks of our absolute encoders) we offer a wide range of pulse dividers and signal distributors such as the IT 10. It has one incremental input (A, A neg., B, B neg., Z, Z neg.) and one divided, adjustable output.
The voltage level of input and output signal can be adjusted to the application (5V or 11 to 27 V). TR-Nr. 490-00009

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Mechanical accessories

Coupling

If selected and mounted correctly, CPS-couplings protect the encoder shaft from, other than rotation, vibrations and shaft movement.

Other accessories on request

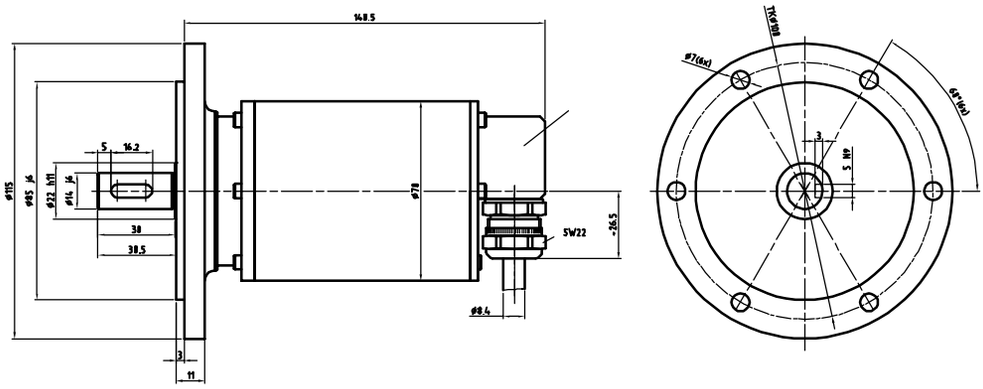
Additonal options (please indicate when ordering) :

In addition to the possibilities shown, we can customize the encoder to your needs, for example with:

· EX housing
· protection housing
· stainless steel encoder
· cable lengths (with cable gland)
· different connectors
(Contact, Binder etc., M12 with field bus end-cap)
· string pot
· impermeable to oil

Some of these options require larger housings.

Example: protective housing



Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Explosion proof encoders

CE 58 EEx
IE 58 EEx

EEx-Housing is an option for our CE 58 and IE 58 encoders. With this housing, you have the possibility to use these versatile encoder families in surroundings with zone 1, 21 as well as 2 and 22 character.

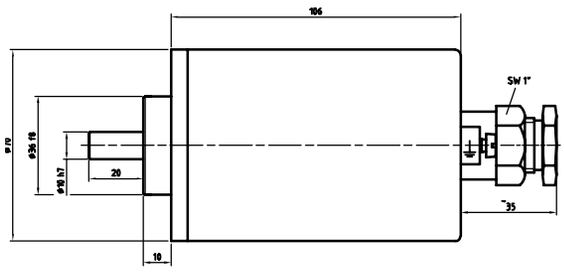
There are limitations concerning flange/shaft and connection technology. Please ask for particular case.

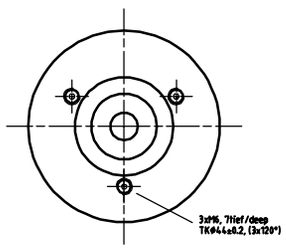
Available explosion-proof certificates	II 2 G/D EEx de IIC T6 für gasförmige bzw. staubhaltige Atmosphären, baumustergeprüft PTB Ex 04-13103
Protection class	IP 66
Maximum rotation speed	6000 1/min (with T6)
Shaft / flange options	Flange ZB 36, shaft 10 round 20mm long or Flange ZB 45, shaft 12 with groove, 24 mm long
Connection	10 m cable, 16 pin, open End + PE-clamp at the housing, axial cable gland

Respect legal regulations for planning and use of this device!

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

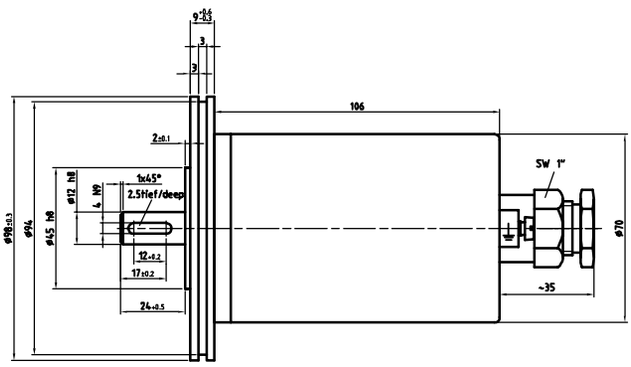
EEx-housing with flange ZB 36 and shaft 10 GL / 20

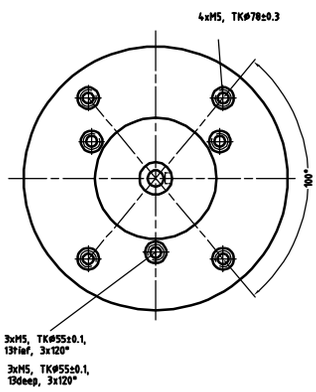




Please ask for detailed drawings for your machine design!

EEx-housing with flange ZB 45 and shaft 12 with groove/24





ATEX-Denominator

(Ex) II 2 G/D EEx de IIC T6

T6	gases with ignition temperature of more than 85 °C
d	protected by pressure proof encapsulation
EEx	certified respecting european standards and regulations
G ... IIC	gases with explosion class IIC (highest class)
D	dusts
2	for use in zone 1 and 2
II	device for „over ground" operation

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

encoTRive

we move the future - decentralized and intelligent

Application

Customized production and batch sizes that are getting smaller and smaller keep on making higher demands on the flexibility of progressive automated plants. More and more importance is attached to resetting times. With encoTRive you manage your setup tasks quickly and in an automated way. All processing of positioning information takes place in the drive, the controller only has to send parameter data via the fieldbus. That means easy cabling, whilst the control load is only increased slightly.

Features

Hardware

in one device: motor
sensor
converter
position closed-loop controller

maintenance-free EC 24V motor (48 V in preparation)

compact configuration with high power and low volume

absolute multi turn encoder

no referencing: after power loss
after emergency stop

Communication

fieldbus

serial interface

fast implementation by existing PLC function blocks

variable connection options

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Hardware options			
Motor	maintenance-free EC-Motor, 24 V (48 V in preparation)		
Gear / brake	planetary and angular planetary gears with different ratios optional brake customized mounting flanges		
Mechanical connection			
Connectivity	different circular and square connectors for fieldbus and power (e.g. Harting DESINA...) as desired		
Typical, technical data	supply:	24 V DC	48 V DC
	typical power output:	62 W (S1)	290 W
Software options			
Measuring system	absolute encoder up to 17 bit / revolution 131 072 revolutions (motor shaft, with respect to gear ratio !)		
Interfaces	Profibus DP (PNO ProfiDrive V2.0, V3.0) CANopen (DSP-402) in preparation: DeviceNet, LightBus, EtherCAT, Powerlink and others diagnostic interface		
Operating modes	absolute point-to-point speed control intermix operation		
Optional functions	memory for positioning data special control algorithms Micro-PLC with 8 I/Os additional measuring system input customized control and closed-loop control functions		
Extras			
	digital inputs and outputs handheld device as desired OEM-specific functions can be integrated		

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

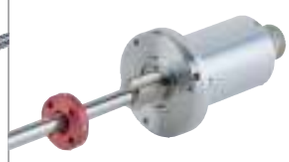
Linear encoders

Storage and logistics

LE 200	LE 10	ID 200	BE 90
Laser range finder	Laser range finder	cableless fieldbus transmission for storage and logistics	non-contact, barcode based absolute measuring system for storage and logistics
			
Measuring range 0,2... 125 m, 0,2... 170 m absolute, others on request	Measuring range 0,2... 50 m absolute	Transmission range 120 m, 200 m others on request	Measuring range 9999 m absolute
Resolution 0,1 mm	Resolution 0,2 mm		Resolution ±1 mm (switchable to ±2 mm)
Programmability via PC, TR WINProg fieldbus	Programmability fieldbus, front panel with display, TR WINProg		Programmability via PC, BE-Config fieldbus
Interfaces SSI Profibus-DP Profibus+SSI CANopen, DeviceNet Interbus-S, others on request		Interfaces Profibus (DP, FMS, MPI) up to 1,5 MBit, CANopen, DeviceNet, Interbus S 500 kBit / s (copper wire), Interbus S 2 MBit / s (FO), Rockwell (DH+, RIO), RS 422, RS 485 on request	Interfaces SSI Profibus-DP
Supply 18... 27 V DC, < 6 W (typ.)	Supply 18... 27 V DC, < 15 W (typ.)	Supply 18... 30 V DC	Supply 11... 27 V DC
Protection class IP 65			
Operating temperature 0... +50 °C,-20... +50 °C optionally		Operating temperature -5... +50 °C,-20... +50 °C optionally	Operating temperature 0... +40 °C, -30... +40 °C optionally
Absolute position measurement of high-level rack and transportation devices, non-contact and perfect for closed-loop control due to the short cycle time.	For short measuring distances with minimal installation space.	The ideal supplement to our non-contact measuring systems.	The barcode based absolute measuring system BE 90 solves even complicated measuring tasks in storage and logistics, especially suitable for systems that move in curves.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Linear absolute distance measurement

LA 25	LA 41 / LA 42	LA 46	LA 65 H
compact, linear absolute distance measurement system for integration in hydraulic cylinders	linear absolute distance measurement system for integration in hydraulic cylinders or for general applications	The universal standard for installation in cylinders	linear absolute distance measurement system with separate pressure casing
			
Measuring range up to 2000 mm > 2000 mm on request	Measuring range up to 4000 mm > 4000 mm on request	Measuring range up to 2000 mm > 2000 mm on request	Measuring range up to 4000 mm > 4000 mm on request
Resolution 0,005 mm, hysteresis < 0,02 mm	Resolution 0,01 mm	Resolution 0,005 mm	Resolution 0,01 mm
Programmability via PC, TR WINProg	Programmability via PC, EPROG fieldbus	Programmability via PC, TR WINProg fieldbus	Programmability via PC, TR EPROG fieldbus
Interfaces synchronous serial analog (U,I)	Interfaces synchronous serial start stop analog (U,I) CAN(open) incremental serial	Interfaces synchronous serial analog (U,I) Profibus DP (**address display, externally viewable**) CANopen, DeviceNet	Interfaces synchronous serial analog (U,I) CAN(open) incremental serial
Supply 24 V DC ±10%, < 4 W (typ.)		Supply 24 V DC ±10%, < 5 W (typ.)	Supply 19... 27 V DC±10%,< 5W(typ.)
Protection class up to IP 65, according to specifications			
Operating temperature -20... +70 °C			
The compact 25 mm diameter sensing head enables integration even when there is only minimal space for installation. The interface electronics are separately housed.	As sensor electronics and interface are placed in the same housing, the LA 41/42 is the perfect all-in-one-device. Two basic types of flanges enable installation in almost any commercial hydraulic cylinders.	The new, universal LA 46 is mechanically compatible to most commercial absolute position measurement systems and therefore perfect for new builds or retrofitting.	Due to the separate housing, the sensing system can be changed without releasing pressure inside the cylinder.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Linear encoders

Linear absolute distance measurement continued

	LA 66	LA 80	LP 38
	Linear absolute measurement system that meets every demand for almost every interface	Linear absolute measurement system for harsh environments with float for level measurement	Linear absolute measurement system in extruded aluminium housing for mechanical engineering applications
			
Maximum operating range	up to 4000 mm > 4000 mm on request		
Maximum resolution	0,01 mm		
Programmability	depends on the interface		
Interfaces available	synchronous serial, analog (U,I) asynchronous serial, parallel, cams, FiberOptic IIO (FO), FIPIO Profibus (PNO), Interbus-S, EtherCAT, Powerlink	synchronous serial incremental serial analog (U,I)	synchronous serial incremental serial, analog (U,I) CANopen, up to 16 magnets CAN DeviceNet Profibus, up to 12 magnets
Supply	24 V DC ±10%		
Protection class (DIN 40 050)	up to IP 65, according to specifications		
Operating temperature	-20... +70 °C		
General description	Due to the spacious housing, the LA 66 also supports those interfaces that more compact devices can not use.	Due to the PE (optional PTFE) casing, the LA 80 is perfectly suitable for the food, paper and electroplating industry. Please ask for the chemical resistivity list.	The multi-magnet option (available for CAN and Profibus) enables measurement of up to 16 (Profibus up to 12) positions at the same time.
Devices shown are a selection from our product range			

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Linear absolute transformation measurement

LP 46	LT S	LT PI	LT RV
Same interfaces as the standard LA 46, but in extruded aluminium housing	high-resolution absolute position measurement system with moving measuring slide	high-resolution absolute measuring gauge for industrial applications	high-resolution absolute position measurement system in heavy-duty design
			
up to 2000 mm > 2000 mm on request	up to 2040 mm	100 mm, 200 mm	400 mm
0,005 mm, hysteresis < 0,02 mm	0,1 µm	0,1 µm	0,1 µm
TR WINProg fieldbus devices via bus	LT-Prog		
synchronous serial analog Profibus DP (**address display, externally viewable**) CANopen DeviceNet	SSI others via interface adapter		
24 V DC, < 4 W	11... 27 V DC		
IP 65	IP 40	IP 66	IP 65
0... +70 °C	0... +40 °C	-10... +60 °C	0... +70 °C
Mechanically compatible with various systems due to adjustable mounting clamps.	Our LT S system is especially suitable for large measuring ranges with high demands on accuracy. Several measuring heads can be used in one system, e.g. for precise multi-blade adjustment in paper cutting machines.	The LT PI enables absolute distance measurement with a resolution of microns even in industrial environments and/or running production processes.	The LT RV is the LT- PI's big brother, especially designed for applications directly on automatic roller lines and the like - that means everywhere absolute measurement with a resolution of microns is required in heavy industry.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

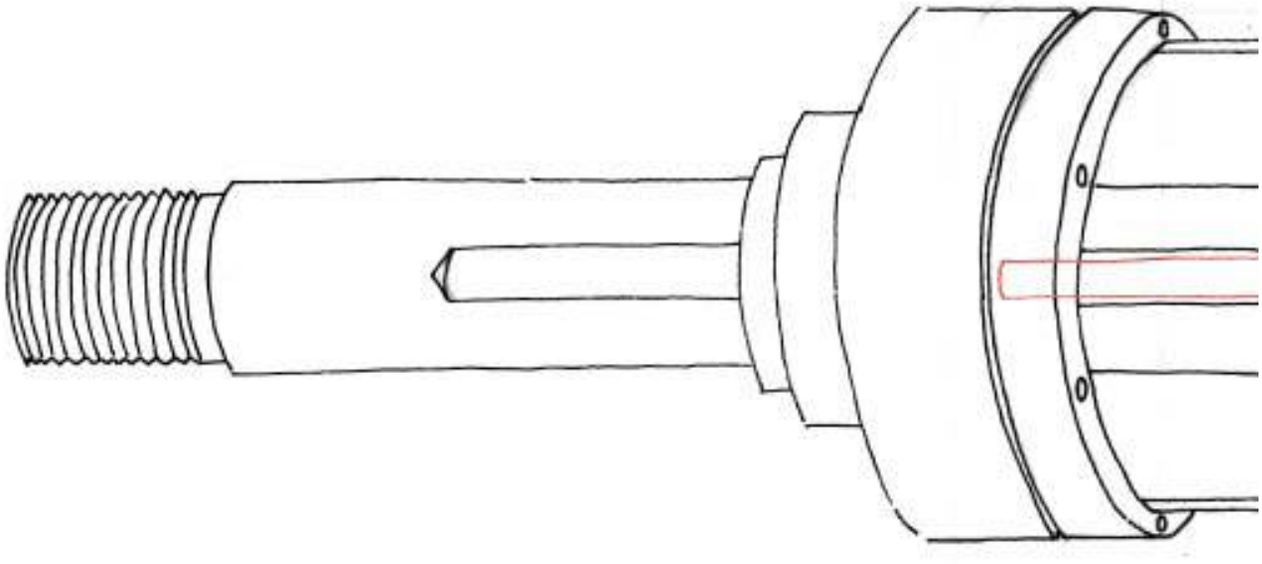
hyTRax®

The perfect symbiosis of power and intelligence

The complete control package. Integrated sensor technology, instrumentation and control intelligence plus integrated process interface, turns your hydraulic cylinder into a compact plug-and-run actuator axis.

The concept:
You need a position controlled hydraulic axis. Up to now you had to integrate the adjustment of cylinder, valve, sensing device and control card with each other and put them into operation. In addition, you were faced with cabling and space accomodation.
Our system co-partner, or you yourself, provide the power of the system by supplying the cylinder and the valve - the intelligence for absolute positioning is located in hyTRax by TR-Electronic.

hyTRax integrates all the signal processing within the sensing device. Besides the pressure and tank line, the desired value set point and the parameter interface are the only connections necessary.
You can choose between simple current/voltage inputs or trend-setting field bus interfaces (Profibus, CANopen, DeviceNet and others).

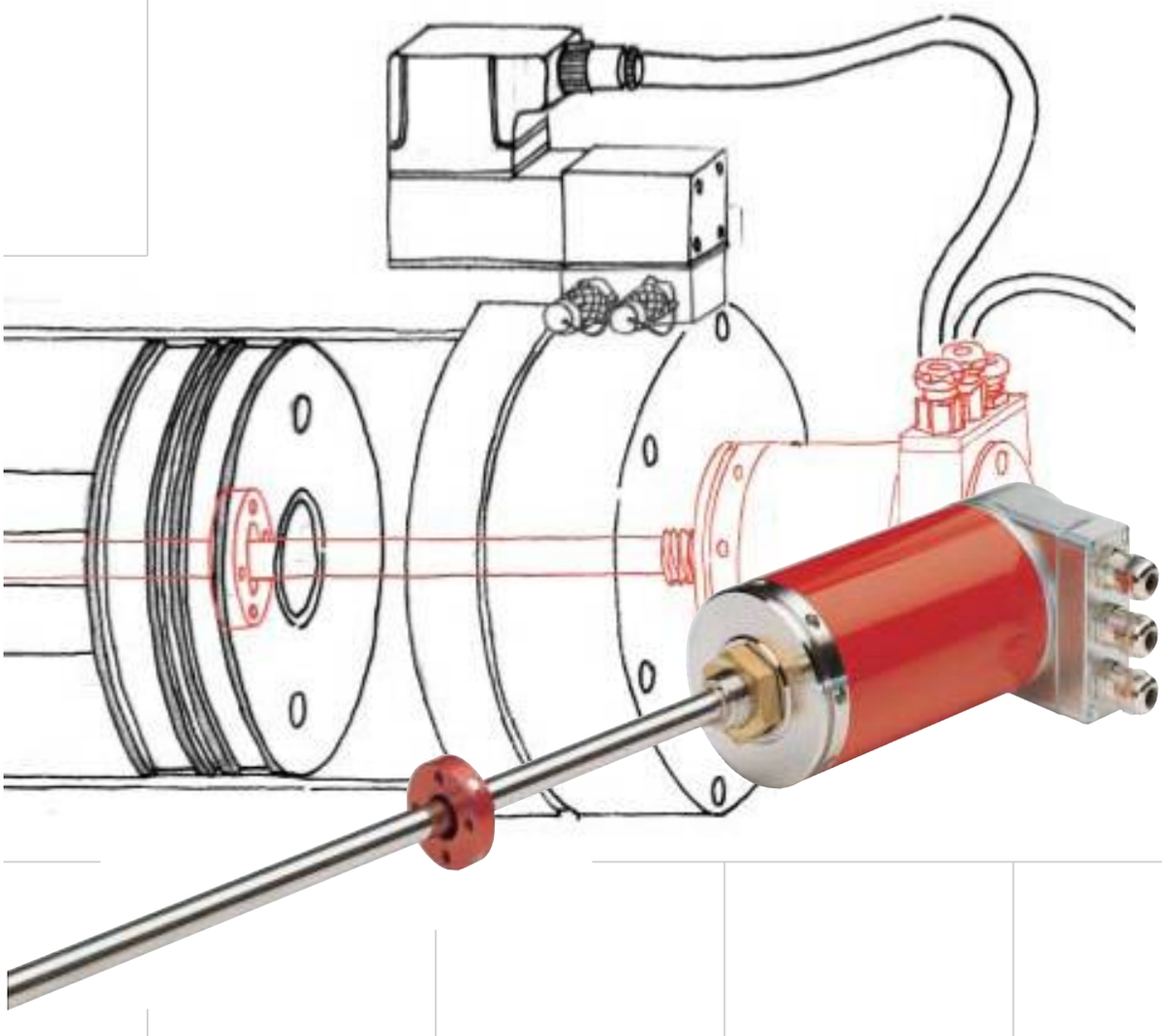


Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

The advantages

- compact, hydraulic drive solution
- self-sufficient, intelligent subsystem as a self-contained component
- minimum cabling
- minimum configuration of process interfaces
- wide range of interfaces for parameterizing and communication
- easy installation and maintenance - just plug-and-run
- minimization of susceptibility to interferences
- modular system, therefore adjustable to individual application requirements
- cost-effective overall solution
- freely programmable positioning commands
- computer-based design configuration of the total axis by TR (performance specifications, concept of control, simulation)



Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Systems

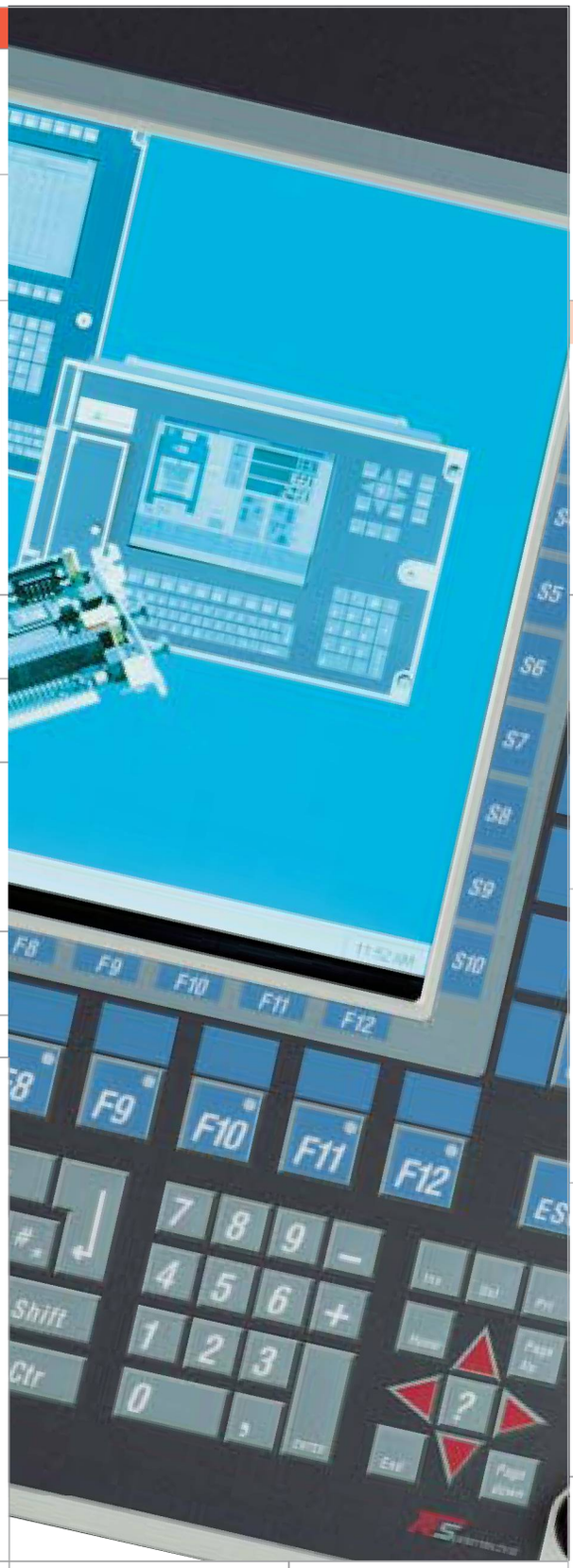
	Industrial PC		
	epc	MIPC	MCC
Features	PC power in panel housing with integrated fieldbus and shock proof mounting	The modular ultimate of automation with front panel and shock proof mounting	Processing power for detached mounting - also in stainless steel housing for food industry
			
Display	12″... 15″ 800 x 600... 1024 x 786	10,4″... 15″ 640 x 480... 1024 x 786	
CPU/ slots	ISA, PISA, PCI according to specifications		
RAM	64 MB		
	optional 128, 256 MB	optional up to 512 MB	
Drives	hard disk 3,5″ flash disk instead of hard disk others on request optional FD, CD (slim size)		all commercial 3,5" PC drives can be integrated RAID-Module
Keyboard	only external keyboard possible touchscreen	short stroke keyboard ABCD, QWERTZ and others F-keys, optional S-keys finger mouse, touchscreen optional	
Interfaces	PC standard interfaces		
Dimensions	B 350 x H 266... B 451 x H 320 6 kg... 9 kg, frontal IP 65	19″, spec. dim., e.g. B 334 x H 504 13 kg... 21 kg, frontal IP 65	B 19″ x H 4 units 19 kg... 20 kg
Supply	24 V DC typical 40 W UPS as an option	120/240 V AC 50/60 Hz switchable 24 V DC 150 W, 200W as an option	typical 150 W... 230 W alternatively 24 V DC, 200 VA, UPS as an option
General description	As fieldbus interfaces can be integrated, it is the perfect control PC and operating panel.	The integrated solution for visualization and efficient control platforms.	The traditional PC solution with detached display. Perfect as production server.
Devices shown are a selection from our product range			

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Displays

edsp

Features	Displays for high industrial demands
	
Display	10″... 15″ 640 x 480... 1024 x 786
	TFT display with backlight, touchscreen as an option
Interfaces	VGA optional digital DisplayNet, LVDS or RGB others on request
Dimensions	B 300 x H 220... B 420 x H 320 5 kg... 6 kg
Supply	24 V DC
General description	Visually, the edsp display's perfectly match the epc series of panel PC's. Due to the various interface options, this display is in high demand for replacement devices and refitting. Using the innovative DisplayNet technology, several displays can be run over extended distances from a single host.



Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Systems

@ctiveIO

Modern plants and machine concepts use decentralized automation systems. TR Systemtechnik consistently supports a broad product range for automation engineering. A prime example is the legendary FOX-series closed-loop controller. It is one of the most universal application devices available, especially in hydraulics and materials handling.

Efficient fieldbusses and Industrial Ethernet expand the possibilities for even more modular plant and machine designs with ever more intelligence going directly into the field. We service these trends and customer requirements with **@ctiveIO**. We have put all our experience and knowledge of industrial electronics, fieldbus and communication technology into the **@ctiveIO** system - completely „made by TR Systemtechnik".

In order to meet the different requirements of large scale and special machine production, we offer **@ctiveIO** in two hardware designs that are compatible with each other. For limited quantities and individual nodes you combine **@C** controller and **@M** I/O-modules yourself. For large quantities we deliver completely configured nodes of @C and **@X** I/O-modules in a common housing. You only order one article and can be sure you always get the node with the same configuration.

Software

As we already mentioned, **@ctiveIO** has more to offer than mere fieldbus communication. You yourself can create and expand the nodes' function using our software modules or programs.

@CAM - High-speed applications demand fast control information. **@CAM** can transfer encoder generated CAM values to several **@IO** modules via the bus.

@AXIS - The successor of the universal closed-loop controller FOX-AXIS. One **@AXIS** controls up to eight electrical or hydraulic axes, even with switchable parameter values (e.g. distance/pressure control).

@PLC - Especially for decentralized control engineering to relieve higher level controls and make plants more modular. **@PLC** - integrates itself control-side like a simple fieldbus node (adjustable width in fieldbus), but can itself process local I/O-signals without fieldbus involvement.

@CUST - Here it's up to you. With our support you can back up your individual control and closed-loop control code in our modules.

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

@M

The key parts of any system are versatile I/O modules. As they are modular, **@M** and **@X**, with an accuracy of 1 byte, can achieve your individual configuration. You can select from standard industrial interfaces, such as digital or analog inputs and outputs, measuring systems and power distribution clamps. That enables flexible and compact solutions. Two types that meet your requirements:

If you use configurations that differ a lot, we deliver the modules in separate housings. When customized and installed on the mounting rail, the **@M** are electrically and mechanically safely connected.

If you use **@ctiveIO**-nodes in series production machines or modules, we match the nodes for you according to your individual needs. These **@X** are placed in a common housing, with the same mechanical characteristics as the single type. Therefore, only one compact assembly for your installation and startup. Additional **@M**-modules can be coupled to those prefabricated **@X**-modules.

@C

The core of the decentralized intelligence is the controller module. It connects the communication technology (fieldbusses, partly Ethernet) with the I/O-level. In addition to the mere transmission of information between fieldbus and I/O-modules, the controllers also take on control and closed-loop control tasks independently. As these software modules make different demands on the hardware, we offer three basic types:

@C100 - The fieldbus node. With the fieldbus-node **@C100** you bring all your I/O-data to the bus.

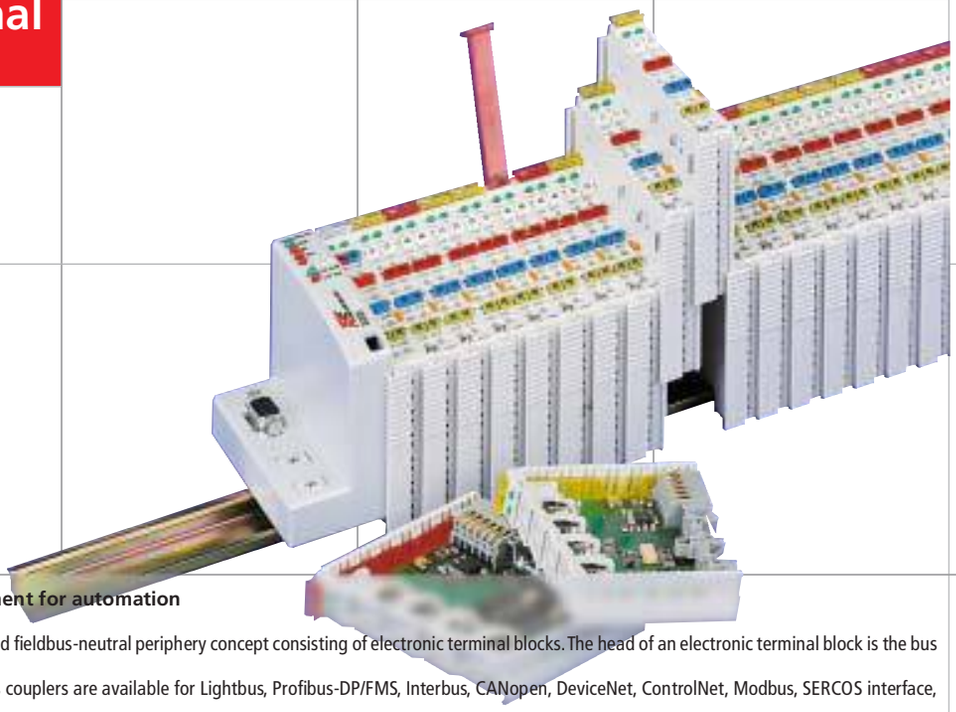
@C200 - Industrial Ethernet on board. In addition to the traditional fieldbus interface the **@C100**'s big brother also offers Ethernet and thanks to our modular architecture we can accomodate existing and future standards.

@C500 - PC power in the field. For applications with high demands on power we offer you a full industrial PC for snap-on, mounting rail fitting. In addition to the I/O-module interface, it also has all standard PC interfaces, such as LPT, COM, keyboard, mouse, VGA and Ethernet. Due to the open PC104-based configuration other interfaces, such as fieldbus master, are easy to achieve.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Systems

Bus terminal



The universal basic element for automation

The bus terminal is an open and fieldbus-neutral periphery concept consisting of electronic terminal blocks. The head of an electronic terminal block is the bus coupler fieldbus interface. Bus couplers are available for Lightbus, Profibus-DP/FMS, Interbus, CANopen, DeviceNet, ControlNet, Modbus, SERCOS interface, RS 232/ RS 485, Ethernet TCP/IP or USB, and new: EtherCAT.

One bus coupler supplies up to 64 electronic terminal blocks for any form of signals. The terminal blocks are clipped onto the bus coupler and connected by simply latching together, without further movement. The I/O-level can be built up uniformly based on the electronic terminal blocks and still remains fieldbus-neutral.

Simple and space-saving

The bus terminal ensures that switch cabinets and terminal boxes are constructed more economically. It is no longer necessary to wire the field devices between the first terminal connection in the control cabinet or in the terminal box and the controller. Therefore terminal boxes and especially switch cabinets get smaller and more reasonable. Installation and wiring of the bus terminal is thus simple and compact like that of a standard terminal block. The bus terminal can be connected to the controller by connecting a bus coupler via the fieldbus as required.

The bus terminal has been highly successful in various industrial sectors using automation systems, such as automotive and manufacturing industry, mechanical engineering, materials handling and environmental technology.

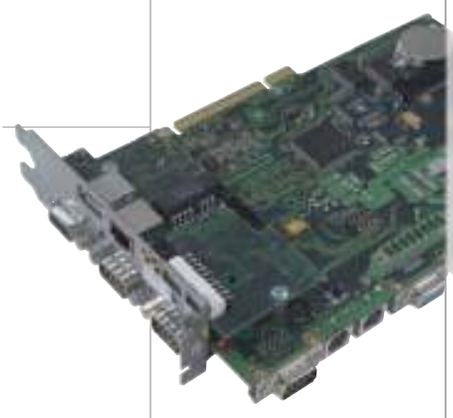
Free mix of signals

The bus terminal components enable users to operate mixed signals without restriction at each station. This means that a single non-central input/output node can map all the necessary signals. Besides digital I/O terminals there are also terminals available for analog signals or current and voltages with standardised signal levels and for the PT100. Intelligent devices can be connected via bus terminals with serial interfaces in accordance with RS 232 C, RS485 or 20 mA TTY.

Devices shown are a selection from our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Slot-PLC



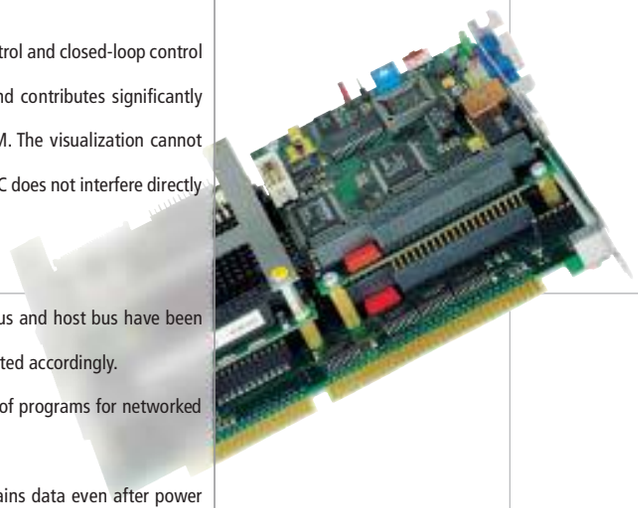
The happy medium

The TR Systemtechnik slot-PLC combines the stability of a hardware PLC with the easy visualization options of a software PLC.

In the past, industrial PC's, in combination with conventional PLC's, were mainly used for visualization tasks. The critical point concerning visualization has always been the serial and/or network connection. The classical PLC becomes redundant when its functions are integrated into an industrial PC. I/O-modules are connected via fieldbusses, such as Profibus-DP, Interbus-S, CANopen, DeviceNet or LightBus. The data for visualization are transmitted quickly via the ISA and/or PCI-bus of the industrial PC, where up to six slot-PLCs can be integrated.

Clear task sharing

Within a plant the host CPU takes on the visualization, whereas the slot-PLC takes on control and closed-loop control tasks. The strict separation of functions increases the transparency of control tasks and contributes significantly to the system's stability. Slot-PLC and host CPU communicate via a decoupled DP-RAM. The visualization cannot directly influence the PLC program. Even a complete crash of an application on the host PC does not interfere directly with the control on the slot-PLC.



As programming languages, S5/S7 and IEC 61131 are available. No matter what fieldbus and host bus have been chosen, the PLC programs can always be used. Only the bus configuration must be adjusted accordingly.

A special feature is the programmability via Ethernet, which enables centralized supply of programs for networked controls.

For plant safety the SPC can be provided with a buffered RAM which permanently retains data even after power failure. In addition, a UPS card can be integrated in order to keep the controller running.

Technical data

According to its instruction set, the SPC is compatible to S7 416 or S5 945. A Siemens-PG with Simatic Manager can be used as a programming unit. Of course other programming systems for S5/S7 can also be used . The connection to the programming system is established either by MPI via RS 232 or by MPI via Ethernet. The SPC operates with a Geode 300 MHz as well as other CPUs and does not require a fan.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR-products in application

Examples of possible applications

Storage and logistics

Powerful, decentralized measurement and control systems, with simple commissioning and set-up, are crucial for modern, automated storage and logistics equipment, such as aisle stakkers, transfer runways and crane installations.

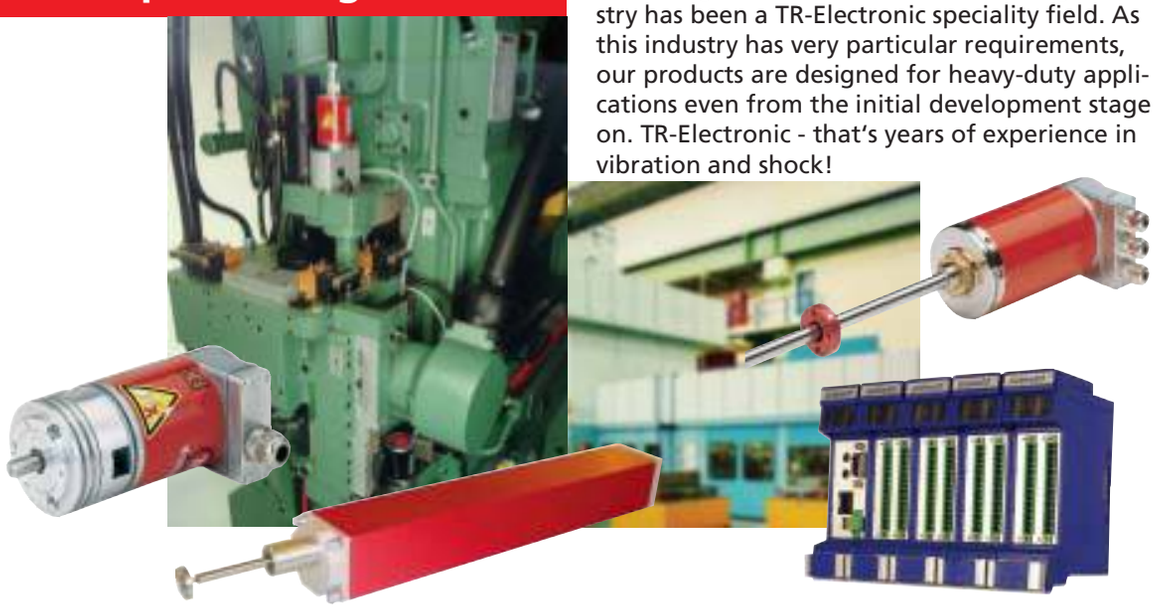
Packaging industry

Solutions for control equipment, adapted to customers' needs, are the intelligent base for successful machine design in the packaging industry. High processing speed is required for short lead times and high production runs.
Absolute sensors no longer require time costly referencing as intelligent, highly integrated sensor technology reduces the volume of the machines and removes load from the master control.
For applications with high demands on accuracy we especially find a suitable solution. In the past that was only a distant hope.

Devices shown
are a selection from
our product range

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Metal processing



For a long time, the sheet metal working industry has been a TR-Electronic speciality field. As this industry has very particular requirements, our products are designed for heavy-duty applications even from the initial development stage on. TR-Electronic - that's years of experience in vibration and shock!

Woodworking

Intelligent, decentralized control technology, powerful sensors with integrated signal processing and components that work reliably despite great variation in temperature and vibration, are the basis for automation solutions for the woodworking industry. Providing automatic transfer facilities on working machines or assembly cells with intelligent systems is our speciality - and especially if you are looking for a platform for your particular machine philosophy or a very particular function.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR-Electronic - Your partner for absolute measurement and control

Innovative solutions as a standard

Coming up with exciting new ideas takes a combination of intuition, innovation and experience with moving components. Anyone who wants to turn his vision of automation technology into tangible benefits should have a specialist like TR-Electronic at his side.

TR-Electronic is a partner who acts as well as reacts - a partner to whom flexibility means more than just product availability.

For TR-Electronic innovation is, therefore, closely linked to the ability to react flexibly to changing requirements. Moreover, the dynamic innovative spirit which has characterized the company since its foundation is still omnipresent after twenty years of active market exposure: providing automation technology with new, future orientated impulses.

Due to the sophisticated interplay of know-how and up-to-the-minute development and manufacturing equipment, TR-Electronic sets new standards.

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR-Electronic, in the foreground the 200m laser referencing track (white). Behind, on the hill, TR-Systemtechnik

In order to fulfil your high expectations, we take the utmost care in the manufacture of our products and subject them to the most stringent criteria. Even the most extreme field conditions can be simulated in our in-house environmental laboratory.
The results of this contribution to reliability are consistently applied to the development and design of TR products.

Worldwide presence

Germany

TR-Electronic TB Süd GmbH
Roland Meyer
Wickerer Weg
D-65719 Hofheim
Tel.: +49 (0) 61 92 / 3 90 61
Fax: +49 (0) 61 92 / 3 68 71
Roland.Meyer@tr-gruppe.de

TR-Electronic TB Süd GmbH
Heiko Flentje
Bühlstraße 41
D-72172 Sulz am Neckar
Tel.: +49 (0) 74 54 / 80 12
Fax: +49 (0) 74 54 / 8 72 84
Heiko.Flentje@tr-gruppe.de

TR-Electronic TB Süd GmbH
Kay Vogt
Tennesseeallee 78
D-76149 Karlsruhe
Tel.: +49 (0) 721 / 94 14 672
Fax: +49 (0) 721 / 94 14 673
Kay.Vogt@tr-gruppe.de

TR-Electronic TB Ost
Dr. Dietrich Thoß
Schäfereistraße 15
D-07973 Greiz
Tel.: +49 (0) 36 61 / 67 11 04
Fax: +49 (0) 36 61 / 67 11 05
Dietrich.Thoss@tr-gruppe.de

TR-Electronic TB Hannover GmbH
Jens Kreibohm
St.Barbara Straße 1
D-31177 Harsum
Tel.: +49 (0) 51 27 / 90 99 01
Fax: +49 (0) 51 27 / 90 99 02
Jens.Kreibohm@tr-gruppe.de

Argentina

AEA Aparátos Eléctricos Automáticos
S.A.C.I.E./ Asunción 2130
RA-1419 Buenos Aires
Tel.: +54 / 11-4574 1155
Fax: +54 / 11-4574 2400
servicioalcliente@aea.com.ar

Australia

Sensor Measurement Pty Ltd.
Unit 8/ 26 Shields Crescent
P.O. Box 1079
Booragoon
Western Australia 6154
Tel.: +61 / 8-93 17 25 52
Fax: +61 / 8-93 17 24 52
sales@sensormeasurement.com.au

Belgium

Martek SPRL - BVBA
Rue du Broux 16
B-1320 Beauvechain
Tel.: +32 / 10 86 82 80
Fax: +32 / 10 86 82 89
info@martek.be
www.martek.be

Brazil

C+Tecnologia
Avenida Pedroso de Morais, 433 -13°andar
CEP-05419-000
Pinheiros - São Paulo -SP
Tel.: +55 11-3815 6554
Fax: +55 11-3815 4979
info@ctecnologia.com.br
www.ctecnologia.com.br

China

TR-Electronic GmbH
Shanghai Rep. Office
Rm102, #74,
Phoenix City,
3536 Nong Yin Du Road
201108 Shanghai, P.R. China
Tel.: +86 / 21 - 5443 5113
Fax: +86 / 21 - 5831 4829
tr-electronic@online.sh.cn

Denmark

FH Gruppen A / S
Bjerrevej 9, DK-8700 Horsens
Tel.: +45 / 76 25 44 44
Fax: +45 / 76 25 44 45
mail@fh-gruppen.dk
www.fh-gruppen.dk

Finland

Sarlin Oy. E. AB
Kaivokselantie 3-5
SF-00101 Helsinki 10
Tel.: +358 / 9-504 441
Fax: +358 / 9-563 3227
myynti.automaatio@sarlin.com
www.sarlin.com

France

TR-Electronic France SARL
56 Boulevard du Courcerin Bât. 16
ZI. Pariest-Marne La Vallée
F-77183 Croissy-Beaubourg
Tel.: +33 / 1-64 62 13 13
Fax: +33 / 1-64 62 20 02
info@tr-electronic.fr
www.tr-electronic.fr

Great Britain

TR-Controls Ltd.
12a Oak Industrial Park
Great Dunmow
Essex CM6 1XN
Tel.: +44 / 1 371-876 187
Fax: +44 / 1 371-876 287
alan@trcontrols.co.uk

India

Global-Tech (India) Pvt Ltd
404 White House
1482 Sadashiv Peth
Tilak Road, Pune - 411 030
Tel.: +91 / 20- 2447 00 85
Fax: +91 / 20- 2447 00 86
info@globaltechindia.com

Israel

DOR Drive Systems L.T.D.
P.O.B. 6 Kibbuz Einat
49910 Israel
Tel.: +972 3 9007595
Fax: + 972 3 9007599
sales@dor1.co.il
www.dor1.co.il

Italy

Telestar S.r.l.
Via C. Colombo 13
I-22069 Rovellasca (Co)
Tel.: +39 / 02-96 74 02 68
Fax: +39 / 02-96 74 02 73
telestar@telestar-automation.it
www.telestar-automation.it

Japan

SANTEST CO. LTD.
1-60 Tsuneyoshi, 1-Chome
Konohanaku
Osaka 554-8691
Tel.: +81 / 6-6465 5561
Fax: +81 / 6-6465 5921
info@santest.co.jp

Canada, Mexico

TR Electronic
P.O. Box 2543, Station B
London, Ontario Canada N6A 4G9
Tel.: +1 / 519-452 1999
Fax: +1 / 519-452 1177
customercare@trelectronic.com
www.trelectronic.com

Netherlands
TR-Electronic Nederland BV
Postbus 1682
NL-6201 BR Maastricht
Avenue Ceramique 221
NL-6221 KX Maastricht
Tel.: +31 / (0) 43 352 3614
Fax: +31 / (0) 43 352 3555
info@tr-electronic.nl
www.tr-electronic.nl

Austria
TR-Electronic GmbH
Bergbaustraße 1
A-8600 Bruck/Mur
Tel.: +43 / 38 62-5 50 06 0
Fax: +43 / 38 62-5 50 06 33
info@tr-electronic.at
www.tr-electronic.at

Poland
Stoltronic-Polska Sp. z o.o
ul. Poniatowskiego 9/4
PL 87-100 Torun
Tel.: +48 / 56-651 03 85
Fax: +48 / 56-651 03 84
stoltronic@stoltronic.pl
www.stoltronic.pl

Sweden
TR-Electronic Sweden AB
Djursholmsvägen 50A
Box 3038
S-18303 Täby
Tel.: +46 / 8-756 72 20
Fax: +46 / 8-756 76 80
mailbox@trelectronic.se
www.trelectronic.se

Switzerland
TR-Electronic SA
14, Ch. Pré-Fleuri
CH- 1228 Plan-les-Ouates/Genève
Tel.: +41 / 22-7 94 21 50
Fax: +41 / 22-7 94 21 71
info@tr-electronic.ch
www.tr-electronic.ch

Singapore
Globaltec Electronics
(Far East) Pte. Ltd.
50 Bukit Batok Street 23
#06-27 Midview Building
Singapore 659578
Tel.: +65 / 6267 9188
Fax: +65 / 6267 8011
globaltec@pacific.net.sg

Slovenia
S.M.M. d.o.o.
Jaskova 18
2001 Maribor
Tel.: +386 / 2450 2300
Fax: +386 / 2450 2302
smm@siol.net
www.smm.si

Spain, Portugal
Intertronic Internacional, SL
Azagador de la Torre, 67 bis
E-46026 Valencia
Tel.: +34 / 96-375 8050
Fax: +34 / 96-375 1022
info@intertronic.es
www.intertronic.es

South Africa
Detek After Sales Service
a division of VAIS-SA
19 Tom Muller Road
P.O. Box 793
Meyerton 1960
Tel.: +27 / 16 3620300
Fax: +27 / 16 3620725
info@vaindserv.co.za

South Korea
MS Industech Co., Ltd.
B-811, SK-Twin Tech Towers
345-9, Gasan-Dong, Guemchoen-Gu
Seoul, Korea
Tel.: +82 / 2-334 0577
Fax: +82 / 2-862 1591
sales@msintech.com

Thailand
TRS Control Co., Ltd.
16/46 M1 Wadlaplakhao Rd.
Jarakhebua, Latphrao
TH-10230 Bangkok
Tel.:+66 25 76 17 23
Fax :+66 29 40 38 22
trthailand@trelectronic.co.th
www.trelectronic.co.th

Czech Republic
DEL a.s.
Strojírenská 38
59101 Žďár nad Sázavou
Tel.: +420 / 566 642 257
Fax: +420 / 566 621 657
del@del.cz

Turkey
Üniversa Iç-Dis Tic. ve Mak. San. Ltd. Sti.
1203/4 Sok. No:5 Ege Ticaret Merkezi
Yenisehir-IZMIR / TURKEY
TR-35110 Yenisehir, Izmir
Tel.: +90 / 232 - 433 29 09
Fax: +90 / 232 - 458 46 31
universa@superonline.com
www.universa.com.tr

USA (TR-Electronic)
TR Electronic
P.O. Box 4448
Troy, MI 48099
Tel.: +1 / 248-244-2280
Fax: +1 / 248-244-2283
customercare@trelectronic.com
www.trelectronic.com

USA (TR-Systemtechnik)
TRS Fieldbus Systems, Inc.
2619 Product Dr
Rochester Hills, MI 48309
Tel.: +1 (586) 826-9696
Fax: +1 (586) 826-8899
support@trs-fieldbus.com
www.trs-fieldbus.com

Eastern Europe, GUS
Stoltronic Handels GmbH
Karl-Kurz Gasse 21
2482 Münchendorf
Austria
Tel.: +43 / 2259 30133
Fax: +43 / 2259 30149
stoltronic@aon.at

Adr: 02/05

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR-Electronic - worldwide presence:

Argentina
Australia
Austria
Belgium
Brazil
Canada
China
Czech Republic
Denmark
Finland
France
Germany
Great Britain
India
Israel
Italy
Japan
Netherlands
Poland
Portugal
Singapore
Slovakia
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Thailand
Turkey
USA

TR-Electronic GmbH
Eglishalde 6
D-78647 Trossingen
Tel.: +49 (0) 7425 228-0
Fax: +49 (0) 7425 228-33
info@tr-electronic.de
www.tr-electronic.de

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR ELECTRONIC

To meet the market demand of sending absolute position to an incremental measuring device, TR has developed an incremental A Quad B interface which is integrated into the absolute encoder and linear transducer. This revolutionary interface converts the absolute position value to incremental pulses. After a loss of power the controller requests the encoder to send its absolute position. This is accomplished with the use of the "LOAD INPUT". Once it has been toggled on and off, the encoder will send a stream of pulses over the A and B channels equal to the absolute position. This makes mechanically homing or zeroing your machine obsolete.

(see inside for details).

ABSOLUTE ENCODERS & LINEAR TRANSDUCERS WITH INCREMENTAL A QUAD B INTERFACE

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

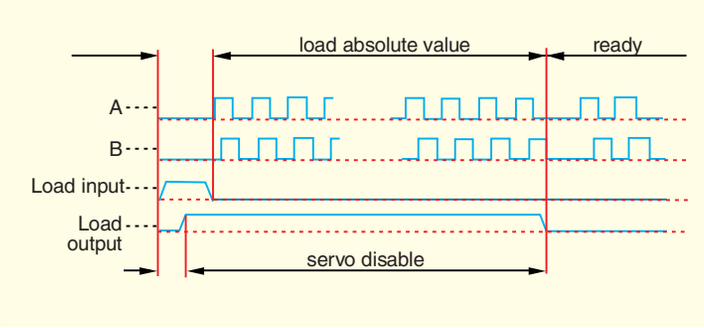
Absolute Encoder CE-65 - ISI, CE-100 - ISI

Overview:

The TR multiturn encoder is an absolute device utilizing a coded optical disk to divide one rotation of its shaft into a maximum of 8192 steps (There are no batteries or capacitors that hold the position while power is off). The shaft also drives satellite disks that track absolute position over 4096 revolutions. Since the encoder utilizes a microprocessor it has the ability to be programmed. Parameters such as the number of steps per revolution, number of revolutions and others can be modified to optimize the system.

In industry, there are many methods for passing absolute position information from the encoder to a controller. Parallel, serial and various fieldbus systems such as DeviceNet are common. TR has developed another interface dubbed the ISI (Incremental Serial Interface). This revolutionary interface converts the absolute position value to incremental pulses. To the controller or counter card this appears to be a normal A quad B incremental encoder signal. With incremental axes, if power is lost, then the system must be mechanically moved to a reference point. With the ISI encoder, however, this is not necessary. After a loss of power the controller only needs to ask the encoder to send its absolute position. To do this there is an input to the encoder call "Load Input". Once it has been toggled on and off, the encoder will send a stream of pulses over the A and B channels that equals the absolute position of the encoder. As a method of hand shaking and to disable motion, a "Load Output" signal is provided which will remain high while the position value is being loaded to the counter module. Once the load output signal drops low, normal real-time operation resumes. The output frequency is programmable from 2kHz to 124kHz. This enables the encoder to interface with a wide range of controllers and counter modules.

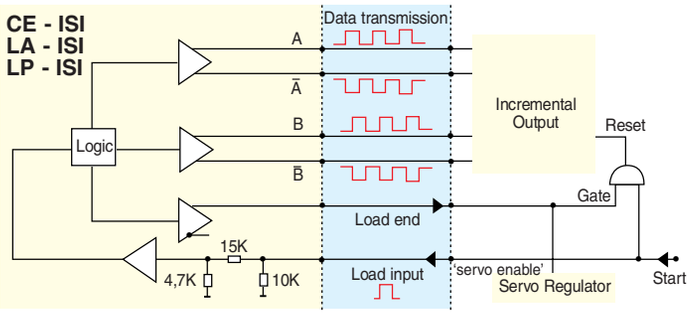
Figure 1



Advantages:

- Any incremental axis can be made absolute with little change in hardware.
- All electronics are contained in the encoder. No additional modules needed.
- Reduced stock requirements.

Figure 2



Absolute - Rotary Encoder

Electrical Specifications:

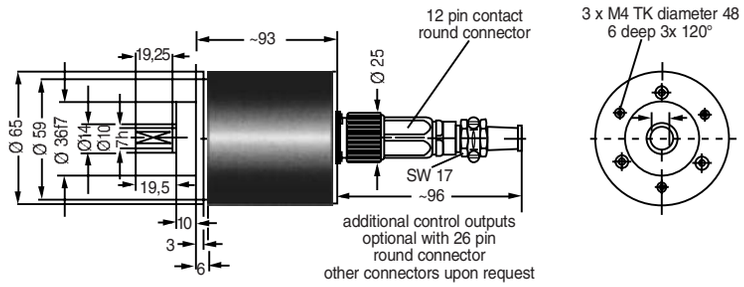
Encoder Capacity	8192 counts/rev x 4096 revs. (2048 ppr x 4096 revs.)
Encoder Capacity Optional	8192 counts/rev x 256,000 revs.
Power Supply	11-27 VDC
Power Dissipation (No Load)	2 watts
Programming via RS485	EPROG software, programming terminal PT 100
Output Code	A QUAD B
Incremental signals:	
Output A, B and Inverted Signals	Line driver RS422, max. current 50mA (5V) or push-pull, max. current 15mA
Load Output	push-pull or RS422 Line Driver Standard
Control Output Options	4 limit switches, overspeed control, direction output, standstill signal, encoder error signal
Inputs:	
Load Input	Standard
Preset 1 + 2	Standard
Special Inputs	Upon Request
Life Time of Opto Electronic	100,000 operating hours
Operating Temperature - Standard	0° to 60° C (32° to 140° F)
- Extended (Optional)	-40° to 70° C (-40° to 158° F) with heater (CE 70 and CE100 only)
Relative Humidity	98% (non condensating)
Protection Class	IP65 (DIN40 050)
Accuracy	+/- 20% relative to 1 increment

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Mechanical Specifications:

Max. RPM	6000 RPM
Max. Load at Shaft	40 N. Axial, 60 N. Radial (end of shaft)
Guaranteed Lifetime of Bearings	3.9 x 10^{10} Rotations at
- Operational RPM	3000 RPM
- Load at Shaft	20 N. Axial, 30 N. Radial (at shaft end)
- Operating Temperature	60° C (140°F)
Protection Class with 26 Pin Connector	IP65 (DIN 40 050)
Storage Temperature	-40° to 70° C (-40° to 158° F)
Weight	CE-65 0.7 kg (1.5 lbs); CE-100 1.3 kg (2.9 lbs)
Max. Angular Acceleration	< 10^{4} rad / sec.^{2}
Momentum of Inertia	2.5 x 10^{-6} Kgm^{2}
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50 - 2000 Hz)	10g (< 100 m / sec.^{2})
Shock (11 msec) IEC 68/2	100g (< 1000 m / sec.^{2})

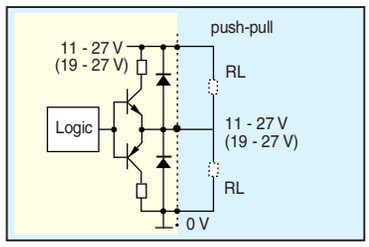
Mechanical Dimensions CE-65-ISI (dimensions in Millimeters)

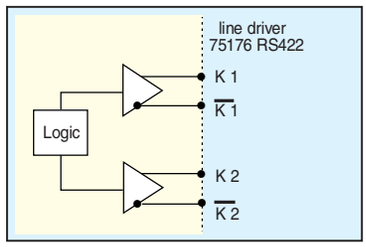


Optional Outputs:

- Overspeed
- Limit Switches
- Direction
- Encoder Error

Outputs:



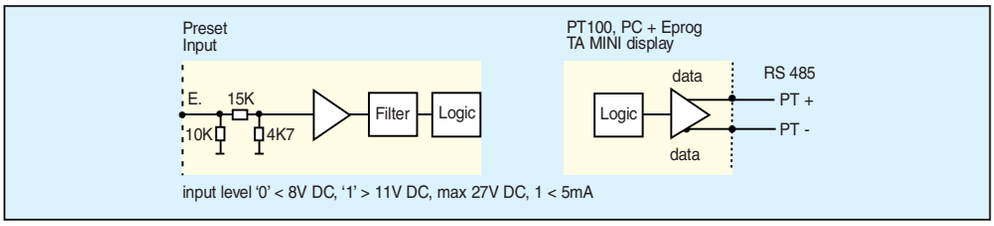


Preset:

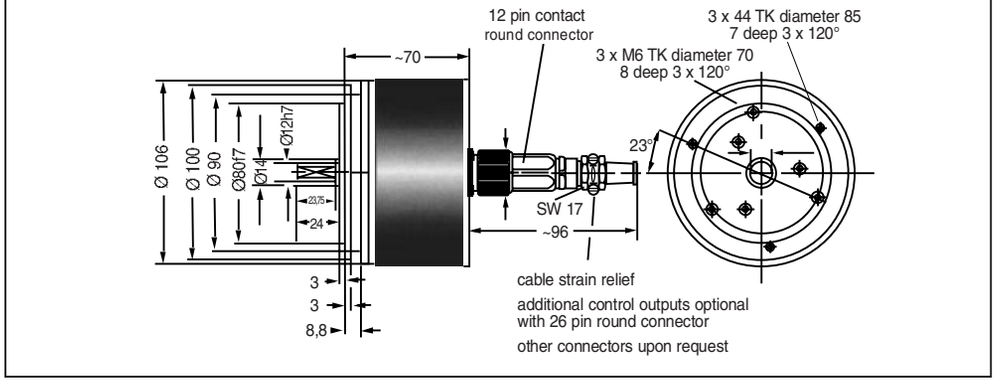
This input enables the encoders absolute position to be adjusted to a predetermined value. This value can be programmed in the EPROG software. On the rising edge of this input the value will be changed. For example, if the preset value is set to 0 in the software, the encoder can be electronically zeroed at the mechanical zero position.

Inputs:

Programming and display interface



Mechanical Dimensions CE-100-ISI (Dimensions in Millimeters)



Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Linear - Absolute Displacement Sensor LA-66-ISI, LP-38-ISI

The measurement is based on ultrasonic propagation delay. The signal propagation time is proportional to the distance and is processed in an electronic circuit. A magnetic position sensor reads the distance without mechanical contact. Current pulses are reflected as ultrasonic signals by the magnetic system and are converted into a distance information.

The processor calculates this distance information and provides it as an incremental A QUAD B signal at the output.

Advantages:

- Robust Mechanics
- No-contact and no-wear sensor
- Suitable for hydraulic cylinders (600 BAR)
- No restrictions regarding operating speed and mounting orientation
- Resolution 0.01 mm
- Programmable, scalable
- All electronics for ISI interface built into sensor
- Inputs: preset, load
- Control outputs upon request

Measuring Method	Magnetostrictive
Standard measuring range (mm)	150, 300, 500, 700, 750, 1000, 1500, 2000
Special Size	custom length upon request
Operating Temperature	0° to 70° C (32° to 158° F) electronics -20° to 80° C (-4° to 176° F) for the measuring mechanics
Protection Class	IP65 (DIN 40 050)
Operating Voltage	19-27 V DC
Programming	PT - 100
Sensor Capacity	depending on length of system
Output Code	A QUAD B
Data Output	A, $\overline{A}$, B, $\overline{B}$

Mechanical Specifications:

Protection Class	IP 65, DIN 40 050
Operating Temperature Range	0° to 70° C (32° to 158° F)
Storage Temperature	-40° to 100° C (-40° to 212° F)
Weight, dependant on type and stroke length	2.0 - 2.9 lbs
Vibration (Max.) (50Hz - 4kHz)	20g (200 m/sec^2)
Pressure Resistance (optional)	8700 PSI static and dynamic (LA-66)
Magnetic Field	<3 mT (milli Tesla)
Operating Speed and Mounting Position	No restrictions

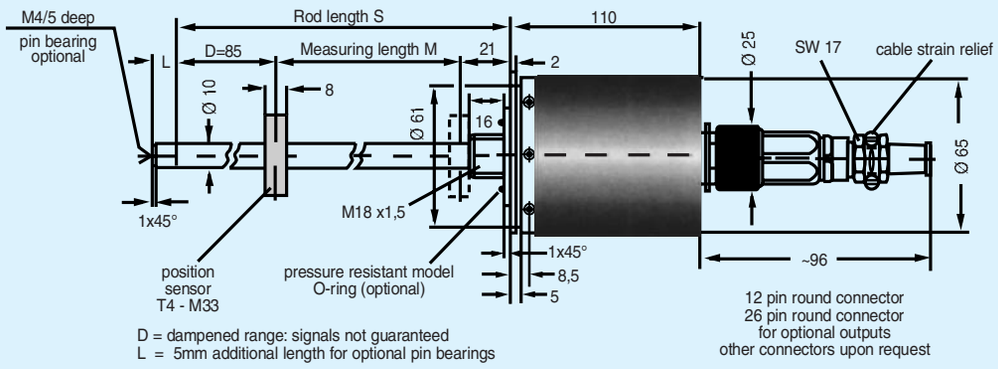
Measurement Specifications:

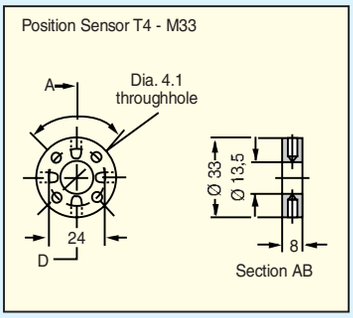
System Resolution	0.01 mm
Linearity	<0.05% of total measurement length
Repeatability	≤0.01 mm
Hysteresis	≤0.01 mm
Temperature Coefficient	5 µm/°C @ 20° to 70°C (68° to 158°F)

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Linear absolute transducer LA - 66 - ISI, LP - 38 - ISI

Mechanical dimensions LA - 66 ISI (dimensions in millimeters)

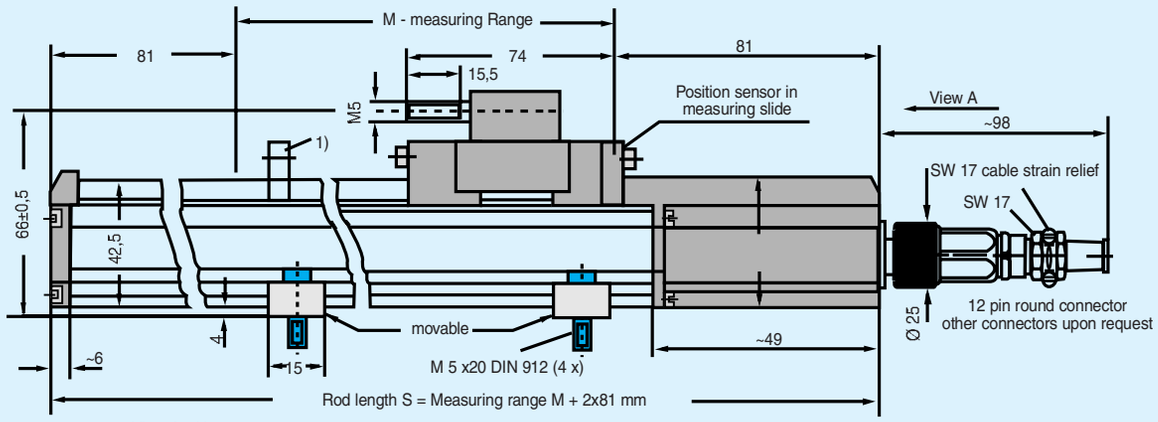


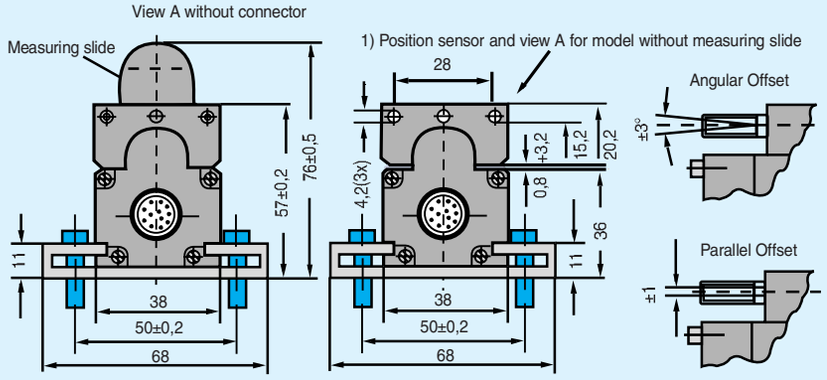


Measuring Range M(mm)	Rod Length S(mm)	Cycle Time (ms)
150	256	1,4
300	406	1,4
500	606	1,4
700	806	1,4
750	856	1,4
1000	1106	1,8
1500	1606	2,7
2000	2106	3,6

Special size upon request

Mechanical dimensions LP - 38 - ISI (dimensions in millimeters)





Measuring Range M(mm)	Rod Length S(mm)	Cycle Time (ms)
150	312	1,4
300	462	1,4
500	662	1,4
700	862	1,4
750	912	1,4
1000	1162	1,8
1500	1662	2,7
2000	2162	3,6

Special size upon request

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR Programmability advantages

The comprehensive line of TR measuring products allows you, the customer, to expand the possibilities for your measuring applications. Specifically, the programmability gives you the following advantages:

- Easy adaptation of the encoder or linear transducer to the controller
- Electronic adjustment
- Easy start up by allowing programming during system design or directly on the shop floor
- Programmability allows for reduced stocking requirements.

Programming with a PC and software

Programmable parameters:

- Counting direction
- Measuring range in increments (CE / LA / LP)
- Measuring range in revolutions (CE)
- Preset values 1 + 2
- Load frequency
- Soft limits
- Overspeed limits
- Active level (H = active, L = active)
- Etc.

TA - MINI as Secondary Display:

- Scalable
- Counting direction (increasing / decreasing)
- Decimals (up to 4)
- Zero
- Special functions upon request

Startup and Noise Considerations:

The use of complex microelectronic circuits in todays machines – especially with AC servo drives – requires a correct application of wiring and electronic noise suppression.

To achieve a perfectly working measuring system, correct wiring is an absolute necessity.

Generally the following guidelines have to be applied:

- Avoid wiring close to high energy cables, avoid parallel wiring with power lines
- Wire size minimum 26 gauge
- Cable size for connection of shielding to the machine or cabinet minimum 10 mm^2
- Star wiring for shielding and 0 Volt
- Connect shielding with maximum contact to common earth ground
- Shut off power before wiring of connector or cabinet

Please note:

- Check connectors on both ends of cable before power up
- Power ON/OFF has to be applied to the encoder and host electronics simultaneously
- Disconnect encoder only during power OFF
- Unused but wired inputs have to be connected to 0 or 11 - 27 VDC

Canada
TR Controls Inc.
1940 Oxford St. E., Units 4 & 5
London, Ontario, Canada
N5V 4L8
1-800-265-9483
Fax: 519-452-1177
trcontrols@trelectronic.com

United States
Head Office
TR Encoder Solutions
1890 Crooks Rd., Suite 200,
Troy, Michigan 48084
1-800-709-3300
Fax: 248-244-2283
trencoder@trelectronic.com

www.trelectronic.com

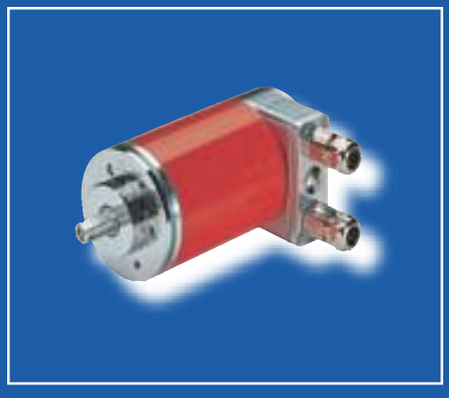
1500/1,98
Printed In Canada

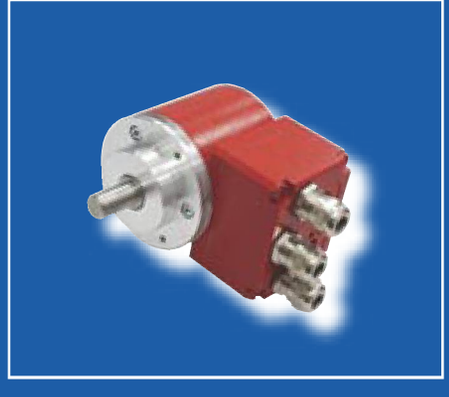
Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Introducing

the *next* generation of *DeviceNet™* absolute position sensors

TR ELECTRONIC ®





DeviceNet™

- *rotary multi-turn high resolution encoders*
- *linear position sensors*
- *laser distance measurement*
- *optical data transmission*
- *barcode position sensors*

TR Electronic - positioning for the future

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR Electronic introduces a comprehensive range of position measurement devices to support the rapidly growing success of the DeviceNet™ fieldbus network.
The well established and industry proven TR absolute rotary encoders and linear position sensors are now supplemented by the laser distance finder, optical data transmitter and barcode position sensor.

Absolute Rotary Encoders

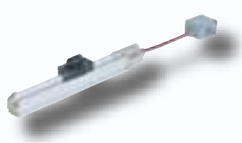
Multi and single turn

CE-65-M

CE-58-M

@ctive IO

	CE-65-M	CE-58-M	@ctive IO
Encoder Capacity	up to 25 bit	up to 28 bit	Using the very latest technology, TRS @ctive IO modules can convert many different outputs, such as incremental, analog, SSI, ISI, parallel etc., to the DeviceNet™ protocol.
*** Steps / Revolution**	8192	8192	
*** Number of Revolutions**	4096	max. 32,768	
Supply Voltage	11 - 27 VDC	11 - 27 VDC	
Power Dissipation *(No Load)*	< 4 Watt	≤ 3 Watt	
Output Code	Binary	Binary, Gray, Shifted Gray	
Protection Class	IP65 standard	IP65 standard	
Data Protocol	DeviceNet™	DeviceNet™	Multiple and variable inputs from non dedicated devices can be processed and transferred to the DeviceNet™ network .
Standard Baud Rate	max. 500 kBaud	max. 500 kBaud	
Station Address	64	64	
Software Inputs			
*** Preset 1**	Adjustable value (ie. zero set)		
*** Preset 2**	Adjustable value (ie. zero set)		
Operating Temperature	-20 to +60° C (standard)	-20 to +60° C (standard)	Contact your nearest TR sales office for full details of this powerful new addition to the TR product range.
Pin Configuration	on request	on request	
*** programmable via bus**			



Hollow shaft (ZH Series) and shaftless (ZK Series) encoders are also available with a DeviceNet™ interface.

Linear Position Sensors

Magnetostrictive

LA-41/42

LP-38

	LA-41/42	LP-38	
Measurement Principle	Magnetostrictive	Magnetostrictive	The LA and LP series linear position sensors are ideally suited for your DeviceNet™ network. A stroke length of more than 3 meters is available on request. Programming features of all TR Electronic devices are programmable via the bus. Heavy Duty versions of the LA-66 and ZE-115 are available for harsh environment use.
*** Stroke Length**	150 - 3000 mm	150 - 3000 mm	
*** Resolution**	0.01 mm (max.)	0.01 mm (max.)	
Supply Voltage	11 - 27 VDC	11 - 27 VDC	
Power Dissipation *(No Load)*	< 4 Watt	< 4 Watt	
Output Code	Binary	Binary	
Protection Class	IP65 standard	IP65 standard	
Data Protocol	DeviceNet™	DeviceNet™	
Standard Baud Rate	max. 500 kBaud	max. 500 kBaud	
Station Address	64 , BCD switch adjustable	64 , BCD switch adjustable	
Inputs			
*** Preset 1**	Adjustable value (ie. zero set)		
*** Preset 2**	Adjustable value (ie. zero set)		
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC		
Operating Temperature	-20 to +60° C (standard)	-20 to +60° C (standard)	
Pin Configuration	on request	on request	
	Multi magnet capable	Multi magnet capable	
*** programmable via bus**			

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Full details and specifications, including EDS files, can be found on our web site at:
www.trelectronic.com
Technical applications support and service are always available at TR Electronic. For special custom requirements call toll free 1-800-265-9483

Laser Distance

Class 2 infra red

LE-200

Measurement Principle	Phase Shift Measurement
Range *(LE 200 to reflector)* ...	0.2 - 125 m. With special reflector up to 170 m
*** Resolution**	0.01 mm
Refresh Update Rate	1 ms
Supply Voltage	18 - 27 VDC, 24 VDC w/heater
Light Source	Laser Diode Class 2
Protection Class	IP65
Interface	DeviceNet™
***Output Code**	Binary/Gray
Baud Rate	max. 500 kBaud
Station Address	64
Inputs	
*** Switching Input**	Preset, Laser Diode off switch
Operating Temperature ...	0 to 50° C (-30 to +50° C with lens heater)
Thermal Drift	1 ppm / °C
Pin Configuration	on request
*** programmable via bus**	

Optical Data Transmission

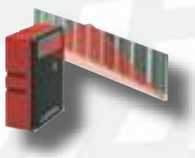
Class 1 infra red

ID-200

Data Transmission	Infra red Laser Beam (Wave Length 880 nm)
Range	max. 200 m
Sensing Distance	0.2 to 200 m
Laser Source	Laser Diode
Laser Class	Class 1
Supply Voltage	18 to 30 VDC
Protection Class	IP65
LED Indication	Voltage Supply, Bar Graph Display of Receiving Level, Operating Mode, Data Traffic
Interface	DeviceNet™
Operating Temperature ..	-5° C to + 50° C -30° C to +50° C (with optics heating)
Set Up	Only one person required

Barcode Position Sensor

Class 2 infra red



BE-90

Measurement Principle	Infra red Laser Beam
Integration Time	16 (8) msec.
Reproducibility	± 1 (2) mm
Measurement Readout ..	1000/s
Resolution	1/100 mm
Supply Voltage	10 - 30 VDC
Operating Temperature	0 to 40° C
With Optics Heater	-30 to + 40° C
Protection Class	IP65
Interface	DeviceNet™
Sampling Distance	60 - 140 mm
Laser Source	Laser Diode
Laser Class	Class 2
Barcode Tape Length	10,000 m
Temperature Range	-40 to -120° C
Adhesive	Acrylic
Environmental	Scratch & Smear Proof, UV Light, Chemical & Humidity

DeviceNet™

TR ELECTRONIC

TR Electronic has been an active member of the ODVA since the beginning.

In addition to normal bus programming capabilities, TR offers extra input and output bytes for changing parameters such as velocity, pre-sets, direction etc., directly via the bus.

Let us demonstrate the power and speed of DeviceNet™ position sensing. Our experience is only equalled by our applications and service support.

Industries :

- Automotive
- Steel
- Packaging
- Food & Beverage
- Shipping
- Mining
- Energy
- Nuclear
- Warehousing
- Military
- Environmental
- Medical

Call 1-800-265-9483
email: info@trelectronic.com
web: www.trelectronic.com

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR Electronic - World leader in absolute rotary encoder, linear displacement transducer, glass scale linear, optical data transmission and laser distance measurement

Service & Technical Support ...

TR recognizes the need for high quality "before and after" sales service.

We offer skilled and intuitive application engineering support for all your positioning requirements.

A "state-of-the-art" technical service department provides unparalleled support either on-site, by 'phone or via the internet.

TR Electronic continues to develop and extend its interactive web site at :
http://www.trelectronic.com
providing access and download of all relevant documentation such as operating manuals, specification data, cable connections and dimensional drawings.

Custom modification and conventional repair capability is backed by a large inventory of product and components.

Contact these TR Electronic services by emailing us at :
service@trelectronic.com
or calling toll free, 1-800-265-9483 anywhere in North America.

Other TR Electronic products ...

- absolute, rotary, programmable, multi-turn, high resolution encoders
- incremental rotary encoders
- software programmable incremental encoders
- linear magnetostrictive position sensors
- glass scale absolute linears
- absolute encoders and linear transducers with incremental A Quad B output

Leading edge technology with industry proven ruggedness and reliability ...

For **world wide** support check "Offices" on our web site at:
www.trelectronic.com

TR Electronic - the standard by which others are measured

United States
Head Office
TR Electronic
P.O. Box 4448
Troy, Michigan 48099
Tel 1-800-709-3300
Fax 248-244-2283
trencoder@trelectronic.com
http://www.trelectronic.com

Canada
Head Office
TR Electronic
P.O. Box 2543, Stn. B
London, Ontario, Canada
N6A 4G9
Tel 1-800-265-9483
Fax 519-452-1177
trcontrols@trelectronic.com
http://www.trelectronic.com

Distributed by:

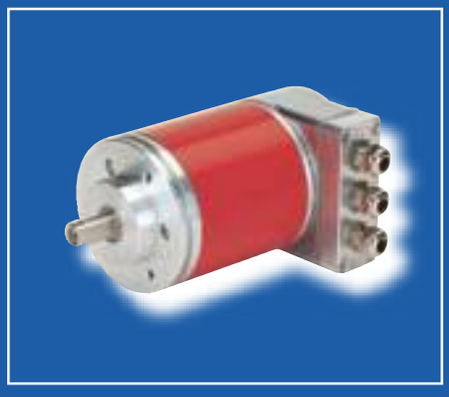
DEV-11-03 Printed in Canada

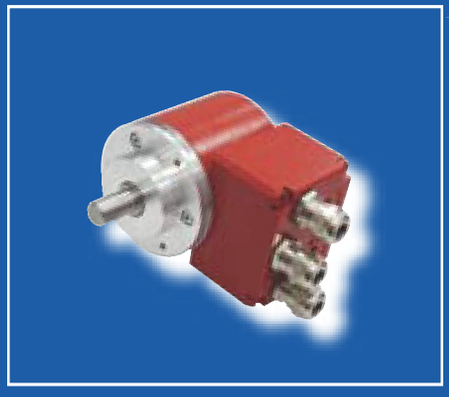
Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Introducing

the *next* generation of *PROFIBUS* absolute position sensors

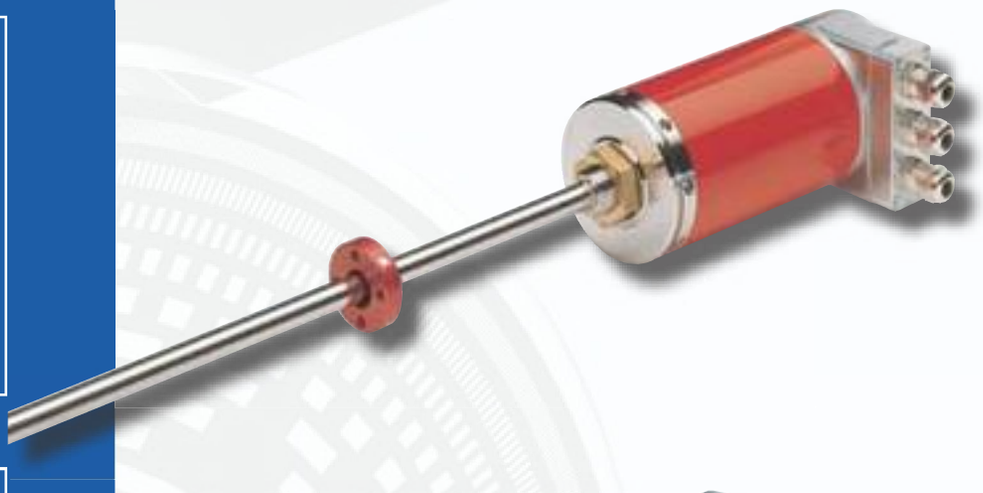
TR ELECTRONIC ®

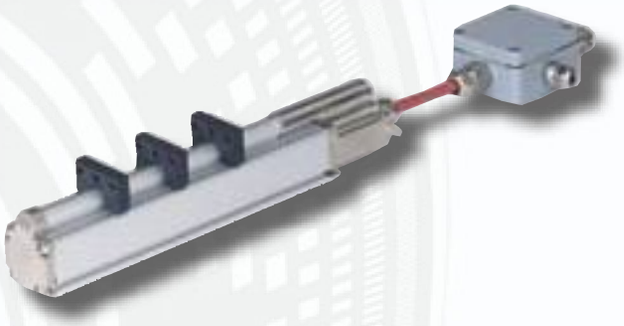




PROFI PROCESS FIELD BUS

- *rotary multi-turn high resolution encoders*
- *linear position sensors*
- *laser distance measurement*
- *optical data transmission*
- *barcode position sensors*





TR Electronic - positioning for the future

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

TR Electronic introduces a comprehensive range of position measurement devices to support the rapidly growing success of the PROFIBUS fieldbus network.
The well established and industry proven TR absolute rotary encoders and linear position sensors are now supplemented by the laser distance finder, optical data transmitter and barcode position sensor.

Absolute Rotary Encoders

Multi and single turn

CE-65-M

ZE-65-M

CE-58-M

	CE-65-M	ZE-65-M	CE-58-M
Encoder Capacity	up to 25 bit	up to 31 bit	up to 28 bit
*** Steps / Revolution**	8192	1 - 131,072	8192 steps / revolution
*** Number of Revolutions..**	4096	max. 65,536 revolutions	max. 32,768 revolutions
Supply Voltage	11 - 27 VDC	11 - 27 VDC	11 - 27 VDC
Power Dissipation *(No Load)*	< 4 Watt	≤ 3 Watt	≤ 3 Watt
Output Code	Binary	Binary	Binary, Gray, Shifted Gray
Protection Class	IP65 standard	IP65 standard	IP65 standard
Data Protocol	PROFIBUS-DP	PROFIBUS-DP	PROFIBUS-DP
Standard Baud Rate	max. 12 Mbaud	max. 12 Mbaud	max. 12 Mbaud
Station Address	3 - 99	3 - 99	3 - 99
Inputs			
*** Preset 1**	Adjustable value (ie. zero set)	Adjustable value (ie. zero set)	
*** Preset 2**	Adjustable value (ie. zero set)	Adjustable value (ie. zero set)	
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC	
Operating Temperature ...	Standard -20 to +60° C	Standard -20 to +60° C	Standard -20 to +60° C
Pin Configuration	on request	on request	on request

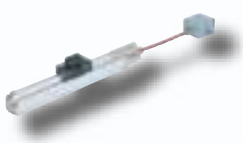
*** programmable via bus**

Hollow shaft (ZH Series) and shaftless (ZK Series) encoders are also available with a PROFIBUS interface.

Linear Position Sensors

Magnetostrictive

LA-66-K



LP-38

	LA-66-K	LP-38	
Measurement Principle	Magnetostrictive	Magnetostrictive	The LA and LP series linear position sensors are ideally suited for your PROFIBUS network. A stroke length of more than 3 meters is available on request. Programming features of all TR Electronic devices are programmable via the bus. Heavy Duty versions of the LA-66 and ZE-115 are available for harsh environment use.
*** Stroke Length**	150 - 3000 mm	150 - 3000 mm	
*** Resolution**	0.01 mm (max.)	0.01 mm (max.)	
Supply Voltage	11 - 27 VDC	11 - 27 VDC	
Power Dissipation *(No Load)*	< 4 Watt	< 4 Watt	
Output Code	Binary	Binary	
Protection Class	IP65 standard	IP65 standard	
Data Protocol	PROFIBUS-DP	PROFIBUS-DP	
Standard Baud Rate	max. 12 Mbaud	max. 12 Mbaud	
Station Address	3 - 99 , BCD switch adjustable	3 - 99 , BCD switch adjustable	
Inputs			
*** Preset 1**	Adjustable value (ie. zero set)		
*** Preset 2**	Adjustable value (ie. zero set)		
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC		
Operating Temperature ...	-20 to +60° C (standard)	-20 to +60° C (standard)	
Pin Configuration	on request Multi magnet capable	on request Multi magnet capable	

*** programmable via bus**

Phone: 877-478-3241
Phone: 877-IP-Tech1
Fax: 877-IP-Tech2
www.iptech1.com

Full details and specifications, including GSD files, can be found on our web site at: www.trelectronic.com
Technical applications support and service are always available at TR Electronic. For special custom requirements call toll free 1-800-265-9483

Laser Distance

Class 2 infra red

LE-200

Measurement Principle	Phase Shift Measurement
Range *(LE 200 to reflector)* **...**	0.2 - 125 m. With special reflector up to 170 m
*** Resolution .....**	0.01 mm
Refresh Update Rate	1 ms
Supply Voltage	18 - 27 VDC, 24 VDC w/heater
Light Source	Laser Diode Class 2
Protection Class	IP65
Interface	PROFIBUS-DP
***Output Code .....**	Binary/Gray
Baud Rate	max. 12 Mbaud
Station Address	3 - 99
Inputs	
*** Switching Input**	Preset, Laser Diode off switch
Operating Temperature ...	0 to 50° C (-30 to +50° C with lens heater)
Thermal Drift	1 ppm / °C
Pin Configuration	on request
*** programmable via bus**	

Optical Data Transmission

Class 1 infra red

ID-200

Data Transmission	Infra red Laser Beam (Wave Length 880 nm)
Range	max. 200 m
Sensing Distance	0.2 to 200 m
Laser Source	Laser Diode
Laser Class	Class 1
Supply Voltage	18 to 30 VDC
Protection Class	IP65
LED Indication	Voltage Supply, Bar Graph Display of Receiving Level, Operating Mode, Data Traffic
Interface	PROFIBUS-DP
Operating Temperature ..	-5° C to + 50° C -30° C to +50° C (with optics heating)
Set Up	Only one person required

Barcode Position Sensor

Class 2 infra red

BE-90

Measurement Principle	Infra red Laser Beam
Integration Time	16 (8) msec.
Reproducibility	± 1 (2) mm
Measurement Readout ..	1000/s
Resolution	1/100 mm
Supply Voltage	10 - 30 VDC
Operating Temperature	0 to 40° C
With Optics Heater	-30 to + 40° C
Protection Class	IP65
Interface	PROFIBUS-DP
Sampling Distance	60 - 140 mm
Laser Source	Laser Diode
Laser Class	Class 2
Barcode Tape Length	10,000 m
Temperature Range	-40 to -120° C
Adhesive	Acrylic
Environmental	Scratch & Smear Proof, UV Light, Chemical & Humidity

TR Electronic has been an active member of the Profibus Trade Organization since the beginning.

In addition to normal bus programming capabilities, TR offers extra input and output bytes for changing parameters such as velocity, pre-sets, direction etc., directly via the bus.

Let us demonstrate the power and speed of Profibus position sensing. Our experience is only equalled by our applications and service support.

Industries :

- Automotive
- Steel
- Packaging
- Food & Beverage
- Shipping
- Mining
- Energy
- Nuclear
- Warehousing
- Military
- Environmental
- Medical

Call 1-800-265-9483
email: info@trelectronic.com
web: www.trelectronic.com

TR Electronic - World leader in absolute rotary encoder, linear displacement transducer, glass scale linear, optical data transmission and laser distance measurement

Service & Technical Support ...

TR recognizes the need for high quality "before and after" sales service.

We offer skilled and intuitive application engineering support for all your positioning requirements.

A "state-of-the-art" technical service department provides unparalleled support either on-site, by 'phone or via the internet.

TR Electronic continues to develop and extend its interactive web site at:
http://www.trelectronic.com
providing access and download of all relevant documentation such as operating manuals, specification data, cable connections and dimensional drawings.

Custom modification and conventional repair capability is backed by a large inventory of product and components.

Contact these TR Electronic services by emailing us at:
service@trelectronic.com
or calling toll free, 1-800-265-9483 anywhere in North America.

Other TR Electronic products ...

- absolute, rotary, programmable, multi-turn, high resolution encoders
- incremental rotary encoders
- software programmable incremental encoders
- linear magnetostrictive absolute position sensors
- glass scale absolute linears
- absolute encoders and linear transducers with incremental A Quad B output
- laser distance absolute measurement - optical data transmission
- bar code scanning absolute position sensors

Leading edge technology with industry proven ruggedness and reliability ...

For **world wide** support check "Offices" on our web site at:
www.trelectronic.com

TR Electronic - the standard by which others are measured

United States
Head Office
TR Electronic
P.O. Box 4448
Troy, Michigan 48099
Tel 1-800-709-3300
Fax 248-244-2283
trencoder@trelectronic.com
http://www.trelectronic.com

Canada
Head Office
TR Electronic
P.O. Box 2543, Stn. B
London, Ontario, Canada
N6A 4G9
Tel 1-800-265-9483
Fax 519-452-1177
trcontrols@trelectronic.com
http://www.trelectronic.com

Distributed by:

PRO-11-03 Printed in Canada