

## Datasheet | Series ILA & Power Injector

### In-Line Amplifier (ILA) Power Injector (PWIN)



### Key Features / Applications

- ▶ Accuracy class 0.01
- ▶ Measuring rate: 40 kS/s; bandwidth: 2 kHz
- ▶ Strain gauge full bridge 80 - 5 kOhm
- ▶ EtherCAT® protocol
- ▶ Decentralized in-line amplifier and industrial power injector (passive)
- ▶ Integrated switch; Power over Ethernet (PoE)
- ▶ Industrial process and quality control
- ▶ Test benches for materials testing

### Accessories

- ▶ Industrial power injector (passive) ILA-PWIN
- ▶ Connection plug M12 (sensor) and RJ45 (system) with protection class IP67; protection caps
- ▶ Measuring cables with suitable connectors for ILA sensor connection

# Technical Data

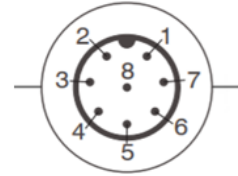
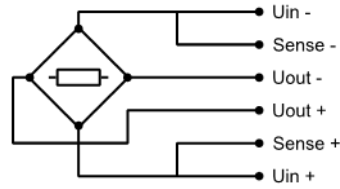
ILA

Metrology	Accuracy Class	%	0,01
	Temperature drift: Zero point	%/10 K	0,01
	Full scale	%/10 K	0,01
Sensor connection	Sensor type		Strain gauge full bridge (Wheatstone), 6-wire connection
	Sensor connection		1 x M12; 8 pin; A-coded; female socket
	Transducer impedance	$\Omega$	80 – 5.000
	Bridge excitation	VDC	5
	Measurement range	mV/V	+/-5
Signal processing	A/D conversion	bit	24bit Sigma Delta
	Sample rate	kHz	40
	Signal bandwidth (-3dB)	kHz	2
	Filtering		Alias free
EtherCAT® <sup>1)</sup>	Device type		EtherCAT® complex slave
	Cable type		CAT5 (and upwards)
	Cable length 1. ILA to ILA unit 2. Total length in one line	m	Always dependent on the number of ILAs in a line and the power supply of the power injector PWIN (24-48 VDC)
	Connection socket		2 x RJ45 (IN + OUT); EtherCAT® signal and supply
	Distributed clocks Sync. delay between ILAs	$\mu$ s	Yes 1
Miscellaneous	Galvanic isolation		yes, measuring input galvanically isolated from the power supply
	Cable length between transducer and ILA	m	10
	IP rating	IP67	When plugged in (with IP67 connectors) 1) Sealing caps for sensor and RJ45 connection as accessories when not in use. 2) Depending on the connectors used, the protection class may differ.
	Power Supply		Power Over Ethernet (PoE); passive via Industrial Power Injector ILA-PWIN or other suitable industrial power injectors
	Nominal (rated) temperature range	°C	-20 ... +60
	Weight	g	250
	Material		anodized aluminium
	Configuration		via process control system

1) EtherCAT® is a registered trademark and patented technology licensed by Beckhoff Automation GmbH, Germany.

**Connection  
pluggable<sup>1)</sup>**

8-pin, M12 A connector



Connection		Pin
Bridge excitation voltage (+)	$U_{in+}$	7
Bridge excitation voltage (+)	$U_{in-}$	6
Measurement signal (+)	$U_{out+}$	1
Measurement signal (-)	$U_{out-}$	8
Sense lead (+)	Sense+	3
Sense lead (-)	Sense-	5
Ground	GND	housing

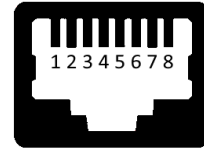
1) Front view



Sensor connection  
M12 A-codet, 8-pin, female

**Connection  
pluggable**

RJ45 socket (IN + OUT)



Connection		Pin
Transmission (+)	TX_P	1
Transmission (-)	TX_N	2
Reception (+)	RX_P	3
PoE (+)	DC +	4
PoE (+)	DC +	5
Reception (-)	RX_N	6
PoE (-)	DC -	7
PoE (-)	DC -	8



RJ45-connection

- ▶ RJ45 connection socket: Type HARTING PushPull V4 with integrated anti-rotation lock, which locks the PushPull locking element in the mated state and secures it against unintentional pulling for more process reliability.
- ▶ Standard RJ45 plugs can also be used, but are not secured against disconnection. Make sure that the plugs are secured against disconnection.



L/A (IN + OUT) and RUN LED's



Sensor LED (Front)

LED—Status	L/A (IN + OUT)	RUN	Sensor
<b>Off</b>	No connection to previous/next device (ILA)	Device is in INIT state	No sensor detected
<b>Always on</b>	Connected, no activity	Unit is in OP condition	Sensor is connected
<b>Flashes very quickly</b>	Connection present, link activity present	-	-
<b>Flashes 2 per second</b>	-	Unit is in PREOP condition	-
<b>Flashes &gt; 1 per second</b>	-	Unit is in SAFEOP condition	Error in the bridge supply. Bridge supply out of specification or only one line connected.

# Power Injector | Accessories

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## GTM Power Injector

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### ▶ Industrial power injector PWIN (passive)

The GTM power injector is a passive industrial Power over Ethernet (PoE) injector. It brings together a 24-48 VDC power source and EtherCAT® communication in a CAT5 (and upwards) cable. The GTM-ILA requires a GTM-PWIN power injector, or other suitable passive industrial power injectors, as the first device in the system topology. Depending on the power injector (PWIN) voltage source and cable lengths, up to 12 devices can be looped through in one line without additional gateways, repeaters or industrial power injectors.



## Connection plug for sensor and RJ45 sockets

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### ▶ Sensor connection plug

Type: Phoenix Contact SACC-M12MS-8Q SH; M12, A coded, 8-pin, straight

GTM item number: S-PL-2000

Phoenix item number: 1543236

### ▶ RJ45 connection plug

Type: HARTING PushPull V4 plug, RJ45, Cat.6A, IDC

GTM item number: S-PL-2001

HARTING item number: 09451451561

## Protection caps for sensor and RJ45 sockets

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### ▶ Protection cap for sensor socket (1 pcs. included in delivery)

Type: Phoenix Contact sealing cap; PROT-M12 MS-PA-CHAIN-EYE-DM1

GTM item number: S-PC-3000

Phoenix item number: 1456200

### ▶ Protection cap for RJ45 socket (2 pcs. included in delivery)

Type: HARTING HPP V4 cap aL IP65/67

GTM item number: S-PC-3001

HARTING item number: 09458450015

# Technical Data

ILA-PWIN

Digital Interface		EtherCAT® IN: signal OUT: signal and supply following ILAs
EtherCAT® sockets		2 x RJ45 (IN + OUT)
Supply connection		1. Removable and screwable terminal connection, max. 2 mm <sup>2</sup> diameter. 2. Connection via hollow plug (without shielding)
Earth connection		Wire terminal
Wire terminal connector type		MC 1,5/3-STF-3.81
Power consumption	mW	< 500
Supply voltage	VDC	12 - 48
Operating temperature	°C	-20 ... +60
IP rating		IP20
Weight	g	105
Housing material		aluminium
Burst protection		acc. 61000-4-4
Surge protection		acc. 61000-4-5

# RJ45-Sockets

ILA-PWIN



RJ45-Sockets	Anschluss
IN	EtherCAT® signal
OUT	EtherCAT® signal and supply following ILA(s)

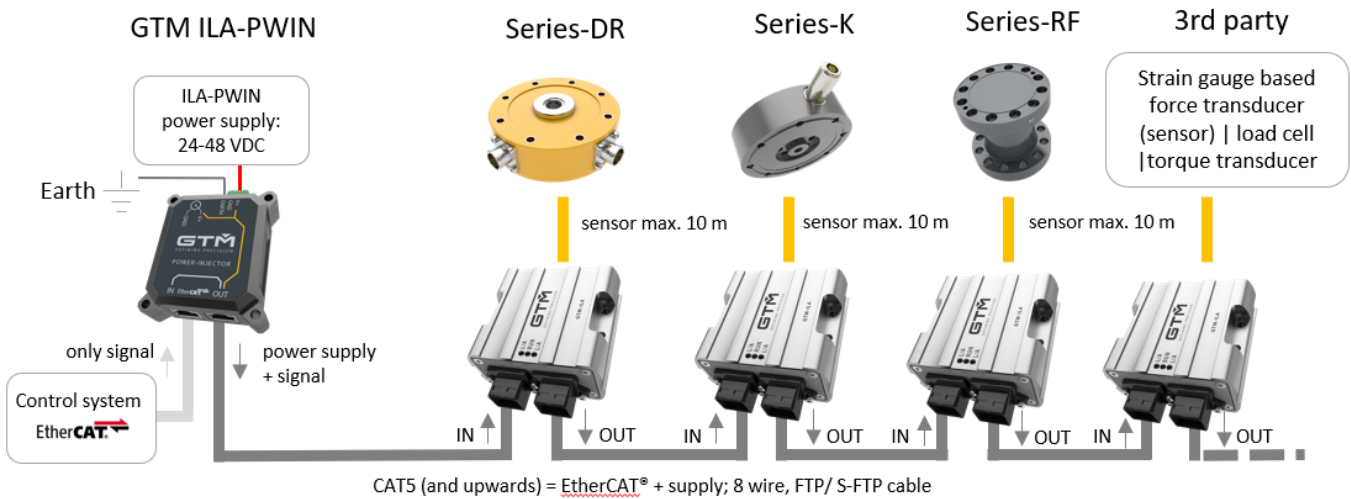
# Power Supply

ILA-PWIN



Terminal	Connection
V+	Power supply (+)
GND	Power supply (-)
Earth	Grounding

# System Topology Example



Never connect the CAT5 (and upwards) lines with the EtherCAT® signal and supply (after PWIN\_OUT) to a PC and / or unsuitable ports in your control system. This may lead to destruction.

This is only an example of a possible system topology.

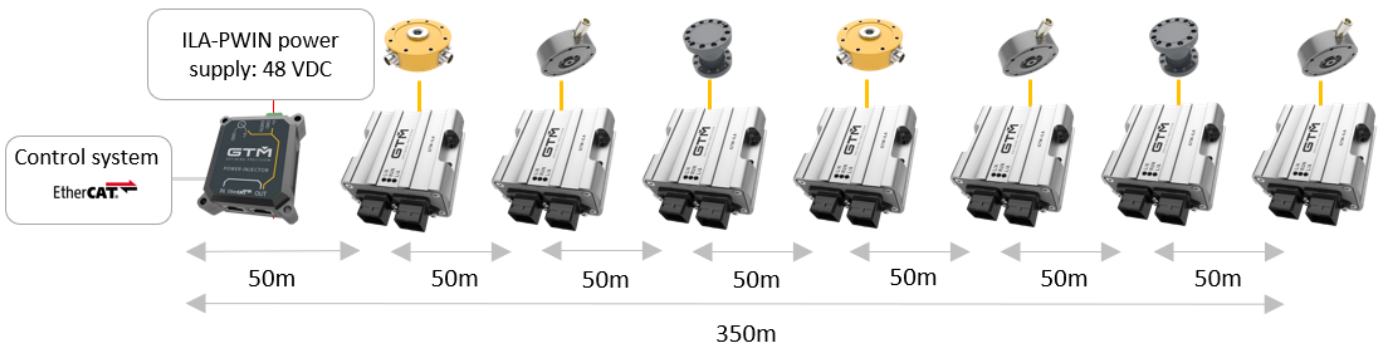
Note: The GTM power injector is not compatible with EtherCAT® P.

# Maximum Permissible ILA Number

Power supply Power Injector (PWIN)	Cable length <sup>1)</sup> between the ILAs (m) / total cable length (m)	Number of ILAs in a line
24 VDC	1 / 7	7
24 VDC	50 / 150	3
48 VDC	1 / 12	12
48 VDC	50 / 350	7

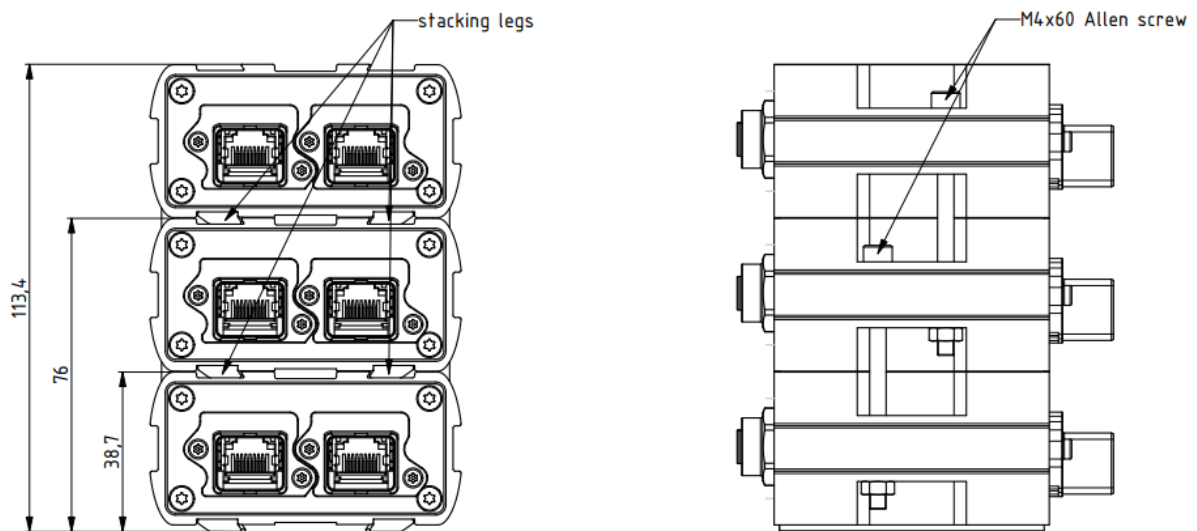
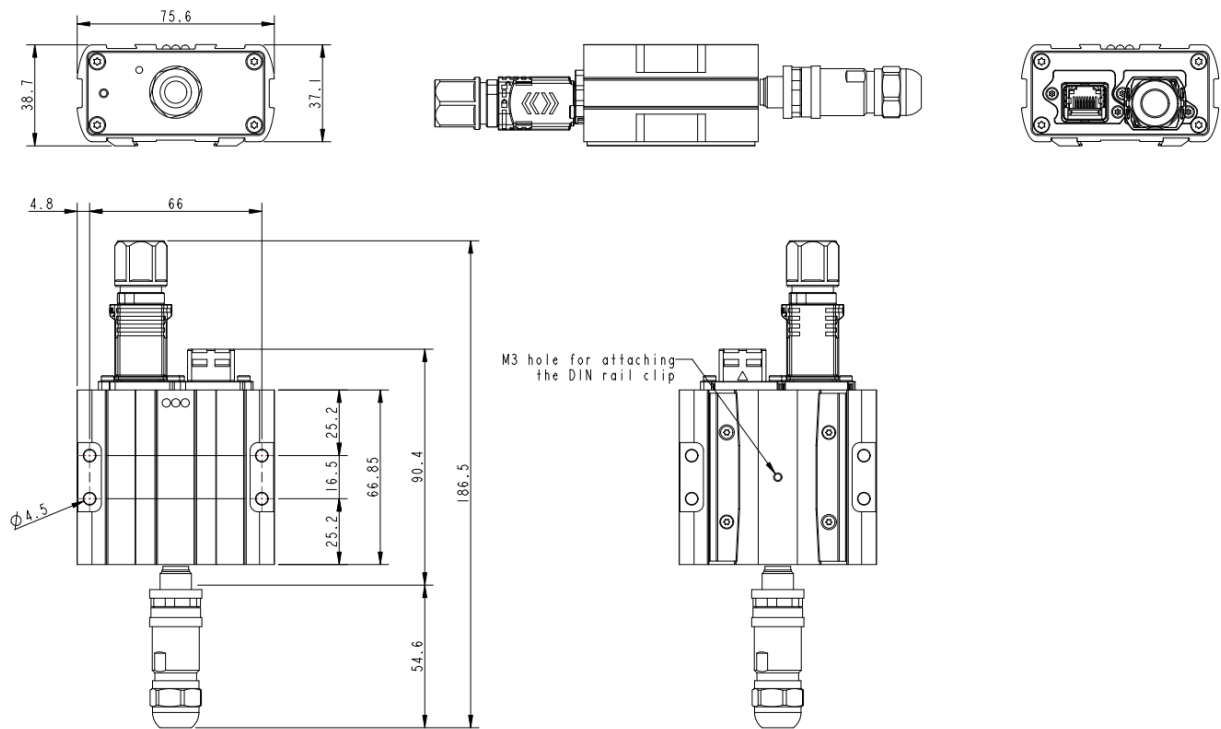
1) Wire size: AWG24 ; 0.5 mm<sup>2</sup>

2) The cable length between the ILA's can be varied (+ 10%), but the total cable length must not be exceeded.



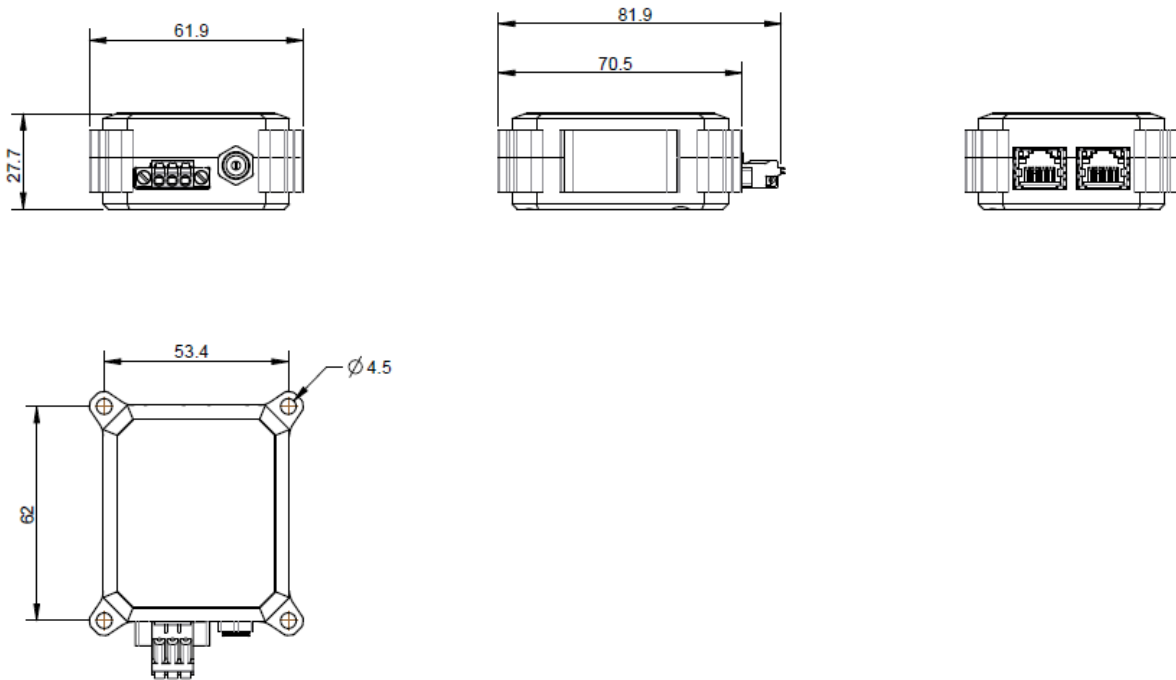
The cable length refers to the CAT5 (and upwards) lines (EtherCAT® + supply) after the power injector (PWIN\_OUT)





## Notes

- ▶ All dimensions in mm
- ▶ The M4x60 allen screws and nuts are not included in the ILA scope of delivery. Other suitable components can also be used.



**Note**

▶ All dimensions in mm

# Order Numbers

Type	Description	Order number
In-line amplifier	Decentralized in-line amplifier with EtherCAT® protocol type ILA, power over ethernet supply	S-ILA-EC
Power Injector	Industrial power injector (passive) for ILA series with EtherCAT® protocol type ILA-PWIN, power supply 24-48 VDC	S-ILA-PWIN
Sensor connection plug	Connection plug for connection to transducer cable; M12; 8 pin; A-coded; straight plug	S-PL-2000
RJ45 connection plug	RJ45 connector type HARTING PushPull V4 plug, RJ45, Cat.6A, IDC	S-PL-2001
Sensor socket protection cap	Protection cap for M12- Sensor connection socket	S-PC-3000
RJ45 socket protection cap	Protection cap for RJ45-connection socket	S-PC-3001

Änderungen vorbehalten. Alle Angaben beschreiben unsere Produkte in allgemeiner Form. Sie stellen keine vereinbarte Beschaffenheit im Sinne des § 434 Abs. 1 BGB dar.



GTM Testing and Metrology GmbH  
Philipp-Reis-Straße 4-6, 64404 Bickenbach, Germany  
www.gtm-gmbh.com  
contact@gtm-gmbh.com  
Phone +49(0)6257-9720-0  
Fax +49(0)6257-9720-77