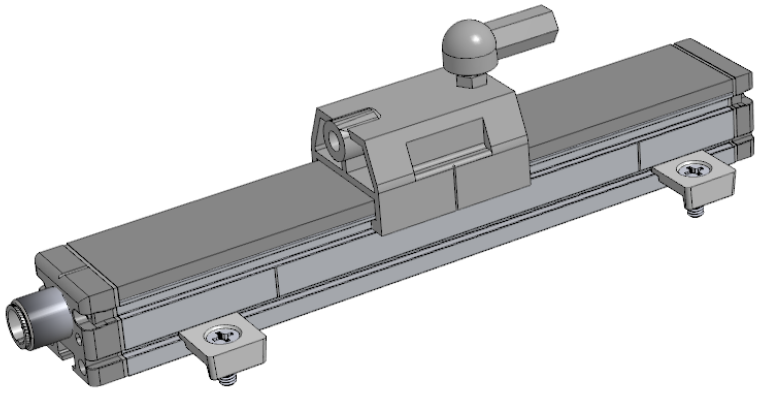
ILT-110

INDUCTIVE LINEAR POSITION SENSOR

CANopen

DS406 - Device profile

Click or scan for CAN EDS (Electronic Datasheet)



USER MANUAL

CONTENTS

1. WARNINGS…… 3
2. TECHNICAL FEATURES…… 4
3. MECHANICAL DIMENSIONS AND MOUNTING……5
4. ELECTRICAL CONNECTION..... 7
5. INTERFACE CONFIGURATION…… 8
   5.1. CONFIGURATION WITH LSS..... 8
   5.2. CONFIGURATION WITH SDO..... 10
6. OBJECT DICTIONARY……..... 11
   6.1. MANUFACTURER SPECIFIC OBJECTS …….... 11
   6.2. STANDARDIZED DEVICE PROFILE..... 11
   6.3. COMMUNICATION PROFILE AREA..... 13
   6.4. MANUFACTURER SPECIFIC EMERGENCY OBJECTS..... 15

1. WARNINGS

- The installation of the product is carried out by the customer who purchases the product, according to the wiring diagrams, installation information, etc. in this manual.
- Maintenance and repair should be done by the technicians authorized by the manufacturer firm.
- There must be minimum distance between the sensor and control unit. Avoid additions except the suitable connector unless it needs.
- The system may perform uncontrolled movements during start-up, especially when it is part of a control system whose parameters have not yet been set. For this reason, the sensor should not be used especially in applications where the safety of property and life depends on the operation of the device.
- For not to damage the sensor, supply directions and voltage range must be paid attention. Don't energize before all connections completed.
- Transducer and controller must be connected by using a shielded cable. The cable shield must be grounded.
- Elongation of the cable connection to more than 30 m results in loss of CE compliance !
- Very strong magnetic fields in the immediate vicinity of the position marker can cause false signals.
- Transport and storage should be at their original packaging and an ambient temperature of -20°C / + 70°C in such a way that they will not be exposed to dust, humudity, impact, vibration, falling or water.
- Chemicals such as alcohol, thinner etc. should not be used for cleaning the product. The product should be wiped with a damp cloth.
- The product may be damaged and may become unusable if used outside of the specifications in the user manual.
- The product will be out of warranty if used outside of the specifications in the user manual and opened or repaired other than authorized services.

2. TECHNICAL FEATURES

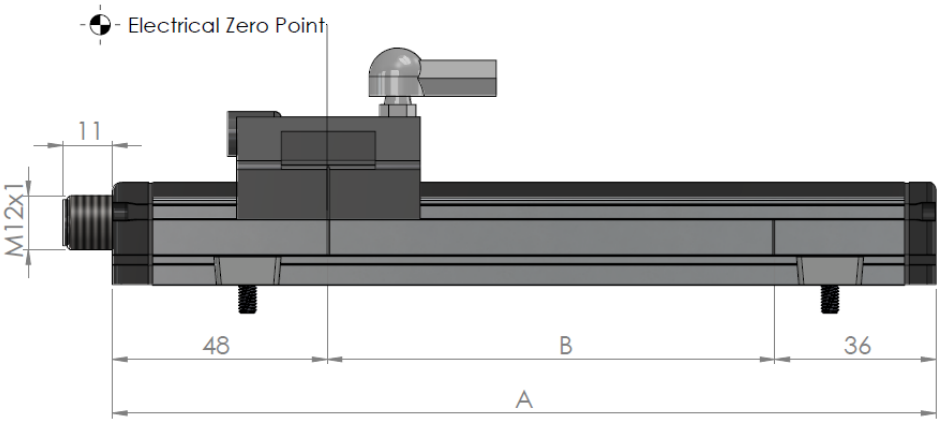
ELECTRICAL DATA

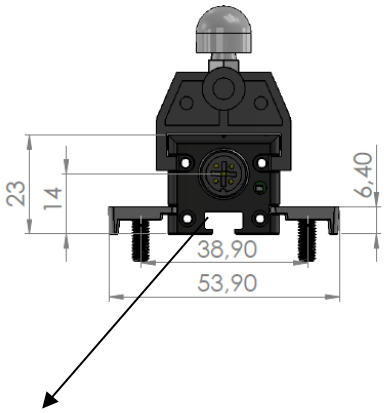
Measured variables	Position, speed and temperature
Electrical stroke (B)	Between 100 mm… 500 mm in steps of 50 mm Between 500 mm… 1000 mm in steps of 100 mm
Measuring range speed	0…5 m/s
Protocol	CANopen protocol to CiA DS-301 V4.2.0, Device profile DS-406 V3.2
Programmable parameter	nod-id, baud-rate
Node-ID	1…127 (default 127)
Baud rate	10 … 1000 kBaud
Update rate (output)	500 Hz
Position resolution	1 µm min.
Speed resolution	10 µm/s min.
Signal propagation delay	2, 3, 4, 5, 6, 8, 10 ms (according to filter selection)
Reproducibility	< ± %0.012 FS (when the signal propagation delay is 10 ms)
Absolute Linearity	≤ ± %0.025 FS (min. ± 100 µm) (when the signal propagation delay is 10 ms)
Supply voltage	8…33 VDC
Supply voltage ripple	≤ %10 Vss
Power consumption (w/o load)	0.5W
Overvoltage protection	33 VDC
Reverse polarity protection	Yes, up to supply voltage max
Short circuit protection	Yes (outputs, GND and supply voltage max.)
Termination resistance	No (optional internal 120 Ω load resistance)

MECHANICAL DATA

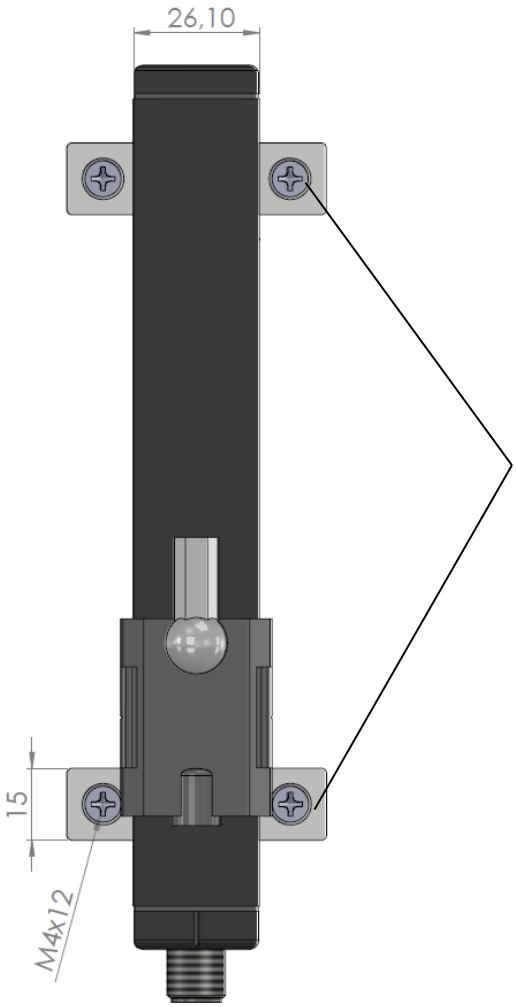
Housing Length (A)	B + 84 mm
Electrical Stroke (B)	Between 100 mm… 500 mm in steps of 50 mm Between 500 mm… 1000 mm in steps of 100 mm
Protection Class	IP64
Life	Mechanically unlimited
Mechanical Fixing	Adjustable (movable) mounting clamps
Operating Temperature	-20°C…+70°C
Storage Temperature	-20°C…+70°C
Material	Position Marker: POM Housing: Anodized aluminum

3. MECHANICAL DIMENSIONS AND MOUNTING





As an alternative to the mounting with mounting clamps the transducers can be fixed by a M8 nut (DIN 439, 4.0 mm thick) which is inserted into the groove.

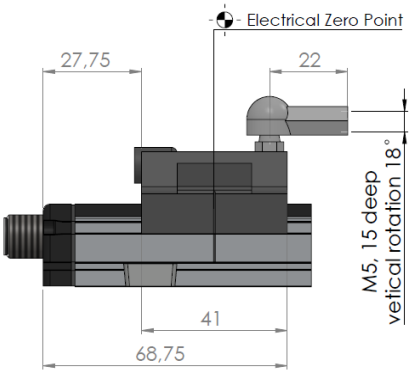


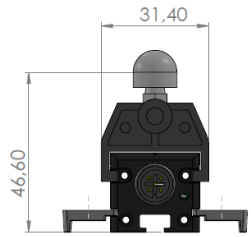
Mounting clamps:

- Do not attach to the flanges solely to the housing profile
- Several mounting clamps : position at an even distance
- 2 mounting clamps : distance to each other approx 2/3 of the housing length

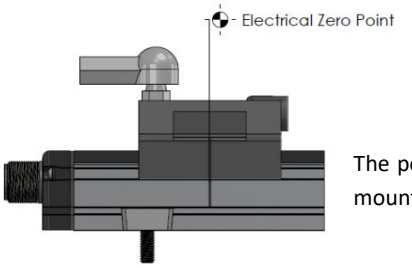
POSITION MARKERS

GPM-U (Guided and Top Joint)



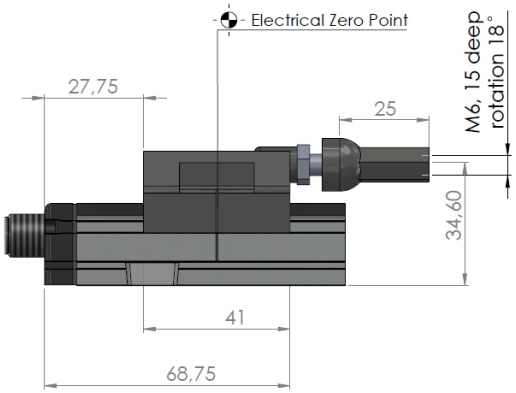


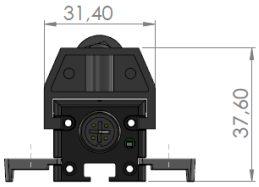
	GPM-6-U	GPM-10-U
Stroke Used	100 … 600 mm	700 … 1000 mm
Housing Material	POM	
Joint Material	Igumid G / iglide® L280 (W300)	
Weight	~20 gr	



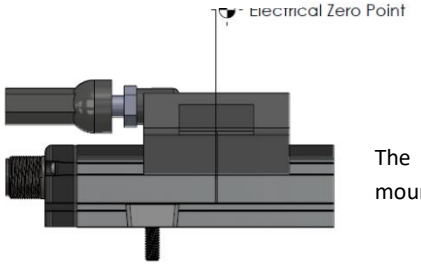
The position marker can be mounted in both directions.

GPM-Y (Guided and Side Joint)



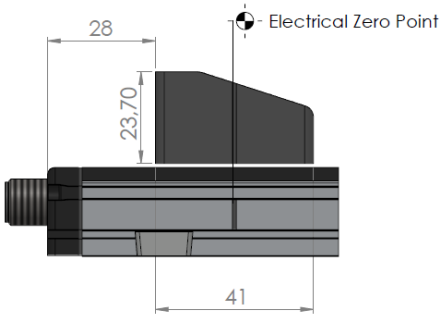


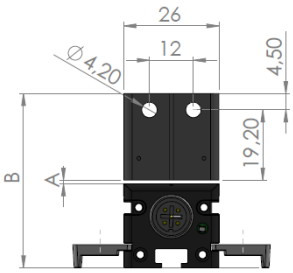
	GPM-6-Y	GPM-10-Y
Stroke Used	100 … 600 mm	700 … 1000 mm
Housing Material	POM	
Joint Material	Igumid G / iglide® L280 (W300)	
Weight	~22 gr	



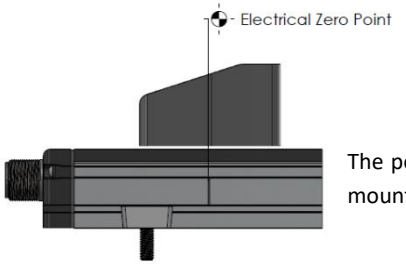
The position marker can be mounted in both directions.

FPM (Floating and independent)





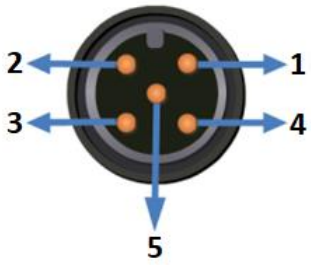
	FPM-6	FPM-10
Stroke Used	100 … 600 mm	700 … 1000 mm
Working Distance (A)	0,3 mm	
Mounting Dimension (B)	47 mm	
Perm. Lateral offset	± 0,5 mm	
Housing Material	POM	
Weight	~23 gr	

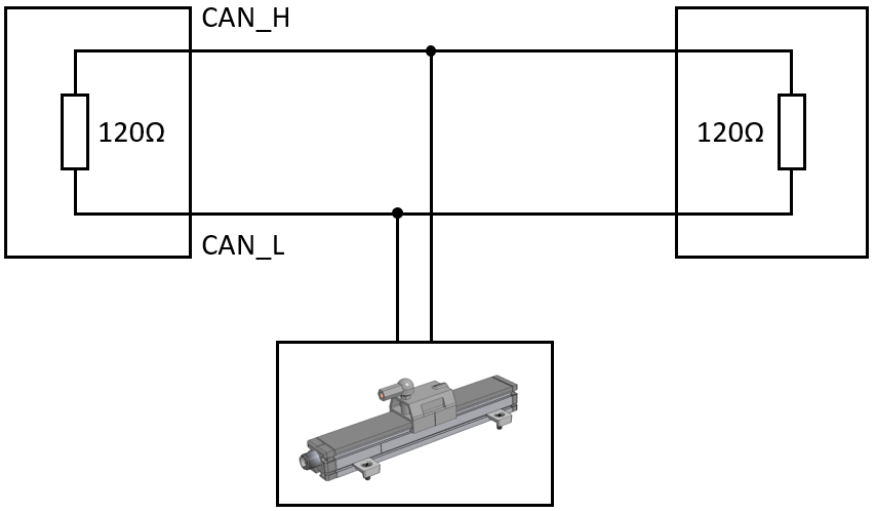


The position marker can be mounted in both directions.

4. ELECTIRCAL CONNECTION

Signal	Cable	M12 / 5 pin male connector
CAN SHIELD	CAN SHIELD	Pin 1
Supply Voltage	Red	Pin 2
GND	Black	Pin 3
CAN_H	Yellow	Pin 4
CAN_L	Green	Pin 5





ILT-110

Click or scan for CAN EDS (Electronic Datasheet)

5. INTERFACE CONFIGURATION

Unless specified in the order, 'Default Node ID:127' and Baud Rate: 500 kBit/s.
These two parameters can be adjusted via 2 protocols:

1. LSS protocol
2. SDO protocol

5.1 LSS Protocol Configuration

To change Node ID and Baud Rate via LSS protocol;

- No other device should be connected to the corresponding CAN network other than LSS master device and LSS slave device whose NODE ID and Baud Rate will be changed.
- LSS Slave's Baud Rate should be known before the configuration.
- Baud Rate's of both LSS Master and Slave should be same.
- Example communications via LSS protocol are given in the Table 1 and 2.

Baud Rate parameter is set according to the table below.

Baud Rate	10 kBit/s	20 kBit/s	50 kBit/s	100 kBit/s	125 kBit/s	250 kBit/s	500 kBit/s	800 kBit/s	1 Mbit/s
Parameter Value	8	7	6	5	4	3	2	1	0

WARNING: All changes are saved automatically and will be active after any reboot.

Message	Details	COB-ID	Data (Hex)
Lss Master Request	Switch Mode Global-Configuration Mode	0x7E5	04 01 00 00 00 00 00 00
Lss Master Request	Inquire Identity – Vendor ID	0x7E5	5A 00 00 00 00 00 00 00
Lss Slave Response	Inquire Identity – Vendor ID : 0x00000000	0x7E4	5A 00 00 00 00 00 00 00
Lss Master Request	Inquire Identity – Product Code	0x7E5	5B 00 00 00 00 00 00 00
Lss Slave Response	Inquire Identity – Product Code : 0x00000000	0x7E4	5B 00 00 00 00 00 00 00
Lss Master Request	Inquire Identity – Revision Nr.	0x7E5	5C 00 00 00 00 00 00 00
Lss Slave Response	Inquire Identity – Revision Nr. : 0x00000000	0x7E4	5C 00 00 00 00 00 00 00
Lss Master Request	Inquire Identity – Serial Nr.	0x7E5	5D 00 00 00 00 00 00 00
Lss Slave Response	Inquire Identity – Serial Nr. : 0x00000000	0x7E4	5D 00 00 00 00 00 00 00
Lss Master Request	Inquire Node ID	0x7E5	5E 00 00 00 00 00 00 00
Lss Slave Response	Inquire Node ID – NID : 0x01	0x7E4	5E 01 00 00 00 00 00 00
Lss Master Request	Switch Mode Global-Operation Mode	0x7E5	04 00 00 00 00 00 00 00

Table 1. LSS auto detect

Message	Details	COB-ID	Data (Hex)
Lss Master Request	Switch Mode Selective – Vendor ID : 0x00000000	0x7E5	40 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Product Code : 0x00000000	0x7E5	41 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Revision Nr. :0x00000000	0x7E5	42 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Serial Nr. : 0x00000000	0x7E5	43 00 00 00 00 00 00 00
Lss Slave Response	Switch Mode Selective Response	0x7E4	44 00 00 00 00 00 00 00
Lss Master Request	Configure Bit Timing Parameters – Table Selector : 0 , Table Index : 4	0x7E5	13 00 04 00 00 00 00 00
Lss Slave Response	Configure Bit Timing Parameters – Success	0x7E4	13 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Global-Operation Mode	0x7E5	04 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Global-Configuration Mode	0x7E5	04 01 00 00 00 00 00 00
Lss Master Request	Activate Bit Timing Parameters – Switch Delay: 100ms	0x7E5	15 64 00 00 00 00 00 00
Lss Master Request	Switch Mode Global-Operation Mode	0x7E5	04 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Vendor ID : 0x00000000	0x7E5	40 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Product Code : 0x00000000	0x7E5	41 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Revision Nr. : 0x00000000	0x7E5	42 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Selective – Serial Nr.: 0x00000000	0x7E5	43 00 00 00 00 00 00 00
Lss Slave Response	Switch Mode Selective Response	0x7E4	44 00 00 00 00 00 00 00
Lss Master Request	Configure Node ID – NID : 0x02	0x7E5	11 02 00 00 00 00 00 00
Lss Slave Response	Configure Node ID - Success	0x7E4	11 00 00 00 00 00 00 00
Lss Master Request	Store Configuration	0x7E5	17 00 00 00 00 00 00 00
Lss Slave Response	Store Configuration - Success	0x7E4	17 00 00 00 00 00 00 00
Lss Master Request	Switch Mode Global-Operation Mode	0x7E5	04 00 00 00 00 00 00 00
Reset	Reset All Nodes	0x000	81 00

Table 2. LSS configuration of NODE ID and Baud Rate

5.2 SDO Configuration

To change Node ID and Baud Rate via SDO protocol;

- LSS Slave's Baud Rate should be known before the configuration.
- Baud Rate's of all devices in the network should be same, and NODE ID's of all devices should be different.

NODE ID Configuration: NODE ID parameter is at Object Dictionary Index:3001 sub-index:0
Please change this parameter in order to change NODE ID.
Example shown below is to change NODE ID from 1 to 5.

Message	Node	COB-ID	Data (Hex)
SDO Download Request	0x01	0x601 (0x600 + Node Id)	2F 01 30 00 Node ID 00 00 00
SDO Download Response	0x01	0x581 (0x580 + Node Id)	60 01 30 00 00 00 00 00

Tablo 3. NODE ID configuration via SDO

Baud Rate configuration: Baud Rate paremeter is at Object Dictionary Index: 3000 sub-index : 0
Baud rate parameter is set according to the table below.

Baud Rate	10 kBit/s	20 kBit/s	50 kBit/s	100 kBit/s	125 kBit/s	250 kBit/s	500 kBit/s	800 kBit/s	1 Mbit/s
Parameter Value	8	7	6	5	4	3	2	1	0

Example shown below is to set Baud Rate to 100 kBit/s.

Message	Node	COB-ID	Data (Hex)
SDO Download Request	0x01	0x601 (0x600 + Node ID)	2F 00 30 00 Baud Rate 00 00 00
SDO Download Response	0x01	0x581 (0x581 + Node ID)	60 00 30 00 00 00 00 00

Table 4. Baud Rate configuration via SDO

WARNING: All changes are saved automatically and will be active after any reboot.

6. OBJECT DICTIONARY

6.1 Manufacturer Specific Objects

Baud Rate Setting

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x3000	0x00	Baud Rate Setting	Unsigned 8	0	Read/Write	Yes	

NODE ID Setting

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x3001	0x00	NODE ID Setting	Unsigned 8	0	Read/Write	Yes	

Auto Operational

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x3002	0x00	Auto Operational	Unsigned 8	0	Read/Write	Yes	Operational mode on startup if set to "1"

Unique ID

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x3010	0x00	Number of Entries	Unsigned 8	4	Read Only	No	
	0x01	Unique ID 1	Unsigned 32	0	Read Only	No	
	0x02	Unique ID 2	Unsigned 32	0	Read Only	No	
	0x03	Unique ID 3	Unsigned 32	0	Read Only	No	
	0x04	Unique ID 4	Unsigned 32	0	Read Only	No	

6.2 Standardized Device Profile

Operating Parameters

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6000	0x00	Operating Parameters	Unsigned 16	0	Read/Write	Yes	

Bit No	15...3	2	1	0
Value	X	SFC	0	CS

CS : if 0; negative direction
if 1; positive direction

SFC : if 0; scaling function is off.
if 1; scaling function is on.

If SFC function is on, 0x6002 parameter is enabled.

Total Measuring Range in Measuring Unit

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6002	0x00	Total Measuring Range in Measuring Unit	Unsigned 32	0	Read/Write	Yes	+- Ful scale value

Preset Value

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6003	0x00	Preset Value	Integer 32	0	Read/Write	Yes	

Position Value

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6004	0x00	Position Value	Integer 32	2	Read Only	No	

Linear Encoder Measuring Step Settings

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6005	0x00	Number of Objects	Unsigned 8	2	Read Only	No	
	0x01	Position Step Setting	Unsigned 32	0	Read/Write	Yes	
	0x02	Speed Step Setting	Unsigned 32	0	Read/Write	Yes	

Speed Value

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6030	0x00	Number of Available Channels	Unsigned 8	1	Read Only	No	
	0x01	Speed Value Channel 1	Integer 16	0	Read Only	No	

Operating Status

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6500	0x00	Operating Status	Unsigned 16	0	Read Only	No	

Measuring Step

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6501	0x00	Measuring Step	Unsigned 32	0	Read Only	No	

Offset Value

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x6509	0x00	Offset Value	Integer 32	0	Read Only	No	

6.3 Communication Profile Area

Device Type

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1000	0x00	Device Type	Unsigned 32	524694	Read Only	No	

Error Register

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1001	0x00	Error Register	Unsigned 8	0	Read Only	No	

Pre-Defined Error Field

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1003	0x00	Number of Errors	Unsigned 8	Up to 8	Read/Write	No	
	0x01..0x08	Standard Error Field	Unsigned 32	0	Read Only	No	Emergency error history.

SYNC COB-ID

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1005	0x00	SYNC COB-ID	Unsigned 32	128	Read/Write	Yes	

Manufacturer Device Name

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1008	0x00	Manufacturer Device Name	String		Const	No	

Manufacturer Hardware Version

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1009	0x00	Manufacturer Hardware Version	String	v1.0	Const	No	

Manufacturer Software Name

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x100A	0x00	Manufacturer Software Version	String	v1.0	Const	No	

Store Parameters

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1010	0x00	Number of Entries	Unsigned 8	1	Read Only	No	
	0x01	Save all parameters	Unsigned 32	2	Read/Write	No	Auto save any changed parameter.

Restore Parameters

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1011	0x00	Number of Entries	Unsigned 8	1	Read Only	No	
	0x01	Restore all default parameters	Unsigned 32	1	Read/Write	No	When set to 0x64616F6C, all parameters reset to default values.

Emergency COB-ID

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1014	0x00	Emergency COB-ID	Unsigned 32	Node ID+0x80	Read/Write	Yes	

Inhibit Time Emergency

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1015	0x00	Inhibit Time Emergency	Unsigned 16	0	Read/Write	Yes	

Producer Heartbeat Time

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1017	0x00	Producer Heartbeat Time	Unsigned 16	0	Read/Write	Yes	

Identity

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1018	0x00	Number of Entries	Unsigned 8	4	Read Only	No	
	0x01	Vendor ID	Unsigned 32	0	Read Only	No	
	0x02	Product Code	Unsigned 32	0	Read Only	No	
	0x03	Revision Number	Unsigned 32	0	Read Only	No	
	0x04	Serial Number	Unsigned 32	0	Read Only	No	

Server SDO Parameter

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1200	0x00	Number of Entries	Unsigned 8	2	Read Only	No	
	0x01	COB-ID Client to Server	Unsigned 32	NODE ID +0x600	Read Only	No	
	0x02	COB-ID Server to Client	Unsigned 32	NODE ID +0x580	Read Only	No	

Transmit PDO 1 Parameter

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1800	0x00	Highest SubIndex Supported	Unsigned 8	6	Read Only	No	
	0x01	COB-ID	Unsigned 32	NODE ID +0x180	Read/Write	Yes	When the Node ID (0x3001) is set, it is set automatically.
	0x02	Transmission Type	Unsigned 8	0	Read/Write	Yes	
	0x03	Inhibit Time	Unsigned 16	0	Read/Write	Yes	
	0x05	Event Timer	Unsigned 16	0	Read/Write	Yes	100 ms
	0x06	SYNC Start Value	Unsigned 8	0	Read/Write	Yes	

Transmit PDO 2 Parameter

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1801	0x00	Highest SubIndex Supported	Unsigned 8	6	Read Only	No	
	0x01	COB-ID	Unsigned 32	NODE ID +0x280	Read/Write	Yes	When the Node ID (0x3001) is set, it is set automatically.
	0x02	Transmission Type	Unsigned 8	0	Read/Write	Yes	
	0x03	Inhibit Time	Unsigned 16	0	Read/Write	Yes	
	0x05	Event Timer	Unsigned 16	0	Read/Write	Yes	
	0x06	SYNC Start Value	Unsigned 8	0	Read/Write	Yes	

Transmit PDO 1 Mapping

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1A00	0x00	Number of Entries	Unsigned 8	4	Read/Write	Yes	
	0x01	PDO 1 Mapping for a process data variable 1	Unsigned 32	1610874912	Read/Write	Yes	
	0x02	PDO 1 Mapping for a process data variable 2	Unsigned 32	1613758736	Read/Write	Yes	
	0x03	PDO 1 Mapping for a process data variable 3	Unsigned 32	536870928	Read/Write	Yes	
	0x04	PDO 1 Mapping for a process data variable 4	Unsigned 32	0	Read/Write	Yes	

Transmit PDO 2 Mapping

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x1A01	0x00	Number of Entries	Unsigned 8	4	Read/Write	Yes	
	0x01	PDO 1 Mapping for a process data variable 1	Unsigned 32	1610874912	Read/Write	Yes	
	0x02	PDO 1 Mapping for a process data variable 2	Unsigned 32	1613758736	Read/Write	Yes	
	0x03	PDO 1 Mapping for a process data variable 3	Unsigned 32	536870928	Read/Write	Yes	
	0x04	PDO 1 Mapping for a process data variable 4	Unsigned 32	0	Read/Write	Yes	

Device Error

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x2000	0x00	Device error	Unsigned 16	0	Read Only	No	

Customer Memory

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x2100	0x00	Number of Entries	Unsigned 8	4	Read Only	No	
	0x01	CustomerMemory 1	Unsigned 32	0	Read/Write	Yes	
	0x02	CustomerMemory 2	Unsigned 32	0	Read/Write	Yes	
	0x03	CustomerMemory 3	Unsigned 32	0	Read/Write	Yes	
	0x04	CustomerMemory 4	Unsigned 32	0	Read/Write	Yes	

Pos Data Filter

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x2200	0x00	Pos Data Filter	Unsigned 8	0	Read/Write	Yes	

Speed Data Filter

Index	Sub Index	Name	Type	Value	Access	Save	Comment
0x2201	0x00	Speed Data Filter	Unsigned 8	0	Read/Write	Yes	

6.4 Manufacturer Specific Emergency Objects

Message	Node	COB-ID	Data (Hex)	Comment
Emergency	0x01	0x081 (0x080 + Node Id)	00 50 80 00 00 00 00 00	Battery level is low.
Emergency	0x01	0x081 (0x080 + Node Id)	03 50 80 00 00 00 00 00	Index 0x4000 value is exceeded.
Emergency	0x01	0x081 (0x080 + Node Id)	02 50 80 00 00 00 00 00	Sensor 2's data is incorrect
Emergency	0x01	0x081 (0x080 + Node Id)	01 50 80 00 00 00 00 00	Sensor 1's data is incorrect .

ATEK ELEKTRONİK SENSÖR TEKNOLOJİLERİ SANAYİ VE TİCARET A.Ş.

Gebze OSB, 800. Sokak, No:814 Gebze/KOCAELİ/TURKEY

Tel: +90 262 673 76 00

Fax : +90 262 673 76 08

Web: www.ateksensor.com

E-Mail: info@ateksensor.com

DISTRIBUTOR / DISTRIBUIDOR

Brazil and South America / Brasil e América do Sul

www.metrolog.net

Metrolog Controles de Medição

Address / Endereço:

Rua Sete de Setembro, 2656
13560-181 - São Carlos - SP
Brazil / Brasil

Phone / Telefone:

+55 (16) 3371-0112
+55 (16) 3372-7800

Internet:

www.metrolog.net
metrolog@metrolog.net