IL CO BK-PAC

Inline, bus coupler for CANopen®, bus interface: 5-pos. MINI COMBICON connector

Data sheet
107010_en_07

1 Description

The bus coupler is intended for use within a CANopen® network. It is the link to the Inline I/O system.
Up to 63 Inline devices can be connected to the bus coupler.
A corresponding EDS file is available for integrating the Inline station into the programming system.
This file can be downloaded via the product at phoenixcontact.net/products.

Features

- Automatic detection of the baud rate in the CANopen® network
- Programmable modes for behavior in the event of an error
- Emergency messages
- Integrated termination resistor can be switched on or off via DIP switch
- Supports two SDO servers simultaneously
- Trigger modes: event, timer, remote request
- Node and life guarding
- Heartbeat
- Connection to CANopen® with 5-pos. MINI COMBICON connector

This data sheet is only valid in association with the IL SYS INST UM E user manual.

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.net/product/2702230

2 Table of contents

3 Ordering data

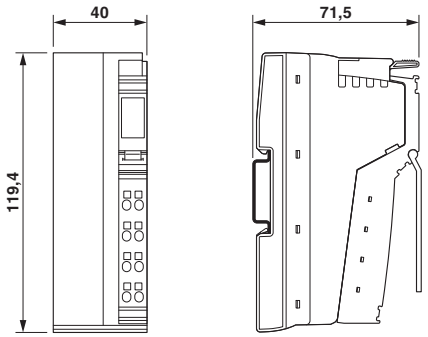
Description	Type	Order No.	Pcs./Pkt.
Inline, Bus coupler, CANopen®, MINI COMBICON, transmission speed in the local bus: 500 kbps / 2 Mbps, degree of protection: IP20, including network connector, Inline connector, and marking field	IL CO BK-PAC	2702230	1

Accessories	Type	Order No.	Pcs./Pkt.
Labeling field, width: 12.2 mm (Marking)	IB IL FIELD 2	2727501	10
Insert strip, Sheet, white, unlabeled, can be labeled with: Office printing systems: Laser printer, mounting type: insert, lettering field size: 62 x 10 mm, Number of individual labels: 72 (Marking)	ESL 62X10	0809492	1
Quick mounting end clamp for NS 35/7,5 DIN rail or NS 35/ 15 DIN rail, with marking option, with parking option for FBS...5, FBS...6, KSS 5, KSS 6, width: 5.15 mm, color: gray (Mounting)	CLIPFIX 35-5	3022276	50
Quick mounting end clamp for NS 35/7,5 DIN rail or NS 35/ 15 DIN rail, with marking option, width: 9.5 mm, color: gray (Mounting)	CLIPFIX 35	3022218	50
PCB connector, nominal current: 8 A, nominal current (Ex): 8 A, nominal voltage (Ex): 160 V, number of positions: 5, pitch: 3.5 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin	MC 1,5/ 5-STF-3,5	1847084	250
PCB connector, nominal current: 8 A, number of positions: 5, pitch: 3.5 mm, connection method: Push-in spring connection, color: green, contact surface: Tin	FMC 1,5/ 5-STF-3,5	1966127	50
PCB connector, nominal current: 8 A, number of positions: 5, pitch: 3.5 mm, connection method: Push-in spring connection, color: green, contact surface: Tin	TFMC 1,5/ 5-STF-3,5	1772731	50

Documentation	Type	Order No.	Pcs./Pkt.
User manual, English, Automation terminals of the Inline product range	IL SYS INST UM E	-	-
Application note, German/English, I/O modules at bus couplers	AH IL BK IO LIST	-	-
User manual, English, Inline bus coupler for CANopen®	UM EN IL CO BK(-XC)-PAC	-	-
Application note, English, Firmware update for the IL CO BK-PAC/IL CO BK-XC-PAC Inline bus coupler for CANopen®	AH EN IL CO BK(-XC)-PAC - FW UPDATE	-	-
Application note, English, Replacing an IL CAN BK-TC(-XC)-PAC bus coupler with an IL CO BK(-XC)-PAC bus coupler	AH EN IL CAN BK-TC(-XC)-PAC / IL CO BK(-XC)-PAC	-	-

4 Technical data

Dimensions (nominal sizes in mm)	



Width	40 mm
Height	119.4 mm
Depth	71.5 mm
Note on dimensions	Housing dimensions

General data	
Color	green
Weight	112 g (with connectors)
Ambient temperature (operation)	-25 °C ... 55 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	10 % ... 95 % (non-condensing)
Air pressure (operation)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Air pressure (storage/transport)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20
Protection class	III, IEC 61140, EN 61140, VDE 0140-1

Connection data: Inline connector	
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.08 mm² ... 1.5 mm² / 0.08 mm² ... 1.5 mm²
Conductor cross section [AWG]	28 ... 16
Stripping length	8 mm

Connection data for UL approvals: Inline connector	
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.2 mm² ... 1.5 mm² / 0.2 mm² ... 1.5 mm²
Conductor cross section [AWG]	24 ... 16
Stripping length	8 mm

Interface: CANopen®	
Number	1
Connection method	MINI COMBICON
Number of positions	5
Transmission speed	1 Mbps, 800 kbps, 500 kbps, 250 kbps, 125 kbps, 50 kbps, 20 kbps, 10 kbps (Can be set via DIP switch or automatic detection)
Transmission length	max. 5000 m (At 10 kbps)

Interface: Inline local bus	
Connection method	Inline data jumper
Transmission speed	500 kbps / 2 Mbps (automatic detection, no combined system)

System limits of the bus coupler	
Amount of process data	max. 512 Byte (Sum of the inputs and outputs for 64 PDOs with 8 bytes each)
IN process data for I/O modules that can be aligned	256 Byte
OUT process data for I/O modules that can be aligned	256 Byte
Number of local bus devices that can be connected	max. 63
Number of devices with parameter channel	max. 16

Observe the logic current consumption of each device when configuring an Inline station! It is specified in every terminal-specific data sheet. The current consumption can differ depending on the individual terminal. The permissible number of devices that can be connected therefore depends on the specific station structure.

CANopen®	
Device profile	CiA 401 V3.0
Communication profile	CIA 301 V4.2

Bus coupler supply U_{BC}; Communications power U_L (7.5 V) and the analog supply U_{ANA} (24 V) are generated from the bus coupler supply.	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption	typ. 51 mA (No local bus devices connected) max. 0.9 A (with max. number of connected I/O terminal blocks)

Communications power (U_L)	
Supply voltage	7.5 V DC
Power supply unit	max. 0.8 A

Supply of analog modules (U_{ANA})	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply unit	max. 0.5 A

Main circuit supply (U_M)	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply unit	max. 8 A (sum of $U_M + U_S$)

Segment circuit supply (U_S)	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply unit	max. 8 A (sum of $U_M + U_S$)

Power consumption	
Power consumption	typ. 1.3 W (entire device)

Protection

NOTE: Electronics may be damaged when overloaded

Provide external protection for the 24 V areas U_{BK}, U_M, and U_S. If you are using an external fuse, the power supply unit must be able to supply four times the nominal current of the fuse. This ensures that it trips in the event of an error.

Error messages to the higher level control or computer system	
CRC error	Message about the emergency object
Peripheral fault	Message about the emergency object
Power error	Message about the emergency object
Module change errors	Message about the emergency object
Inactive local bus	Message about the emergency object
Inline connection error	Message about the emergency object
Faulty Inline cycles	Message about the emergency object

Approvals

For the latest approvals, please visit phoenixcontact.net/products.

5 Comparison with previous device

	IL CAN BK-TC-PAC	IL CO BK-PAC
Order No.	2718701	2702230
DIP switch		
Device address	7	7
Transmission speed	3	2
Termination resistor	0	1
Device profile (I/O modules)	CiA 401 V1.4	CiA 401 V3.0
Communication profile	CiA 301 V3.0	CiA 301 V4.2
Transmission speed	10 kbps, 20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 MBbps	10 kbps, 20 kbps, 50 kbps, 125 kBit/s, 250 kbps, 500 kbps, **800 kbp**s, 1 Mbps, **Auto baud**
Termination resistor	No	Yes
Modular EDS file	No	Yes
Firmware update possible via network	No	Yes
SafetyBridge Technology V3 supported	No	Yes
Transmission speed in the local bus	500 kbps	500 kbps or 2 Mbps (automatic detection)
Power supply at U_L	max. 2 A	max. 0.8 A
Number of devices with parameter channel (PCP)	8	16

A modular EDS file is used for the generic structure of parameter and process data objects in an I/O station, depending on the connected Inline terminals. This type of modular device description can be integrated into the CODESYS V3 engineering tool, for example.

6 Internal circuit diagram

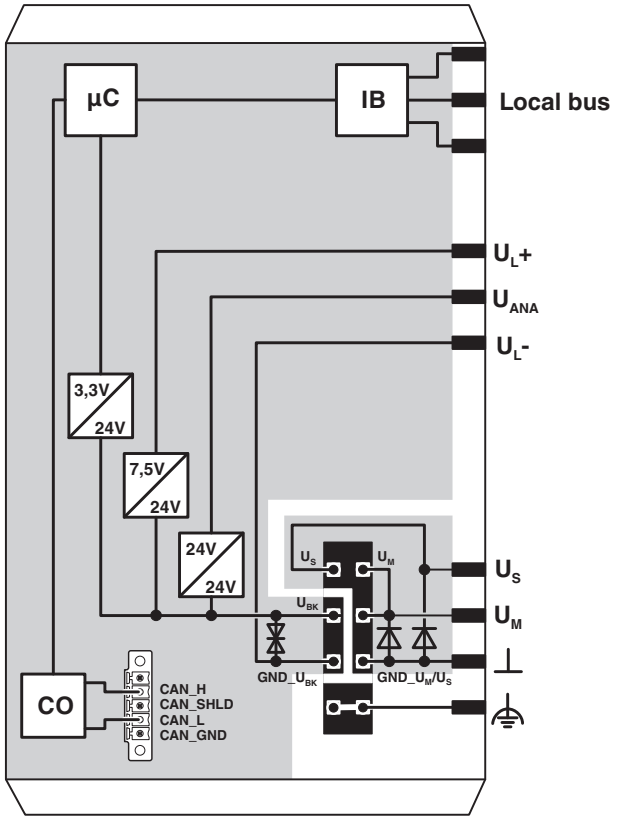


Figure 1 Internal wiring of connections

Key:

µC Microcontroller

IB Protocol chip

Power supply unit

Electrically isolated area

Please refer to the IL SYS INST UM E user manual for an explanation of other symbols used.

7 CANopen® connection and supply

7.1 Connect CANopen®

Connect CANopen® using the MINI COMBICON connector included in the scope of supply.

The MINI COMBICON connector has a pitch of 3.5 mm.

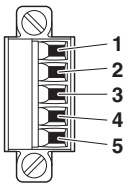


Figure 2 Terminal point assignment

Terminal point	Printing	Signal	Meaning	Color in the network cable
1	n.c.	Not used		red
2	H	CAN_H	CAN bus signal (dominant high)	white
3	FE	CAN_SHLD	CAN shield	Bare
4	L	CAN_L	CAN bus signal (dominant low)	blue
5	GND	CAN_GND	CAN ground	black

Minimize the influence of electromagnetic interference by using shielded network cables.

7.2 Connecting the supply voltage

Connect the supply using the Inline connector included in the scope of supply.

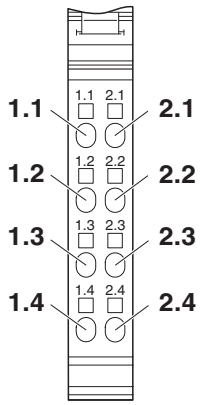


Figure 3 Terminal point assignment

Terminal point	Assignment	Meaning
1.1	U_S (24 V DC)	24 V supply for segment circuit
1.2	U_{BK} (24 V DC)	24 V bus coupler supply/7.5 V logic power supply/24 V analog power supply
2.1, 2.2	U_M (24 V DC)	24 V supply for main circuit
1.3	GND U_{BK}	Ground
2.3	GND U_M/U_S	Ground
1.4, 2.4	FE	Functional earth ground

NOTE: Module damage due to overload

Make sure that the maximum total current flowing through the potential jumpers is 8 A.

For information on the power supplies, please refer to the IL SYS INST UM E user manual.

If you want to use the same reference potential for communications power and segment voltage, you can bridge the terminal points 1.3 and 2.3 on the connector.

Connect the functional earth ground via the power connector.

8 DIP switches

The bus coupler has ten DIP switches, which are located on the left-hand side of the bus coupler.

Set the device address using the DIP switches 1 to 7. Set the baud rate using the DIP switches 8 and 9. You can switch the termination resistor on and off using DIP switch 10.

The DIP switches will be read only upon startup.

To make a change to at least one of the DIP switches, switch the supply voltage U_{BK} off and back on again.

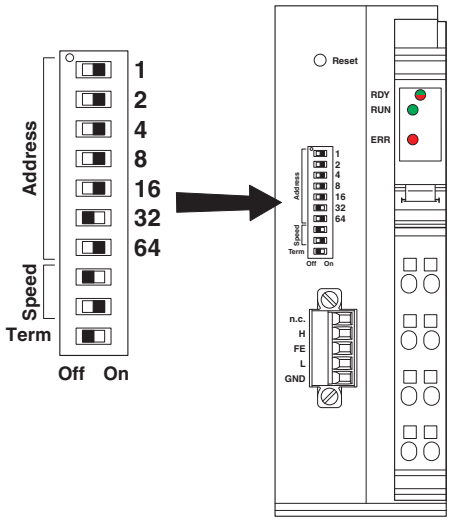


Figure 4 DIP switches

8.1 Setting the device address

Set the device address using DIP switches 1 to 7.
DIP switch 1 is the least significant digit of the device address and DIP switch 7 is the most significant digit.
Valid device addresses are in the range from 1 through 127.

The device address 0 is reserved. It is used for the automatic configuration of the periphery connected to the module (see Section "Automatic configuration").

Switch	Device address (Address)
1 ... 7	
1	Least significant digit (1_{dec})
7	Most significant digit (64_{dec})

8.2 Setting the transmission speed

Use DIP switches 8 and 9 to set the transmission speed.

Switch		Transmission speed (Speed)
8	9	
ON	ON	1 Mbps
ON	OFF	500 kbps
OFF	ON	125 kbps
OFF	OFF	Auto baud (1 Mbps ... 10 kbps, all CANopen® baud rates)

If “Auto baud” is set as the transmission speed for the bus coupler, it automatically detects the baud rate in the system.

Possible transmission speeds: 10 kbps, 20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 800 kbps, 1 Mbps.

The bus coupler can only automatically detect the baud rate in the system if it receives at least two valid CAN telegrams.

8.3 Switching the termination resistor on and off

Use DIP switch 10 to switch the termination resistor on or off.

Switch	Termination resistor (Term)
10	
ON	Switched on
OFF	Switched off

For more detailed information on networking and the termination resistor, please refer to the bus coupler user manual.

9 Diagnostics

9.1 Local diagnostics and status indicators

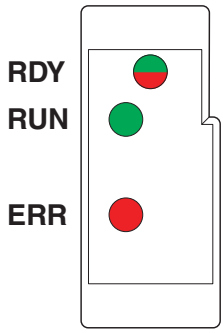


Figure 5 Local diagnostic and status indicators

Designation	Color	Meaning	State	Description
RDY	Green/ yellow/ red	Bus coupler status		
			Green on	Bus coupler is ready to operate.
			Green/yellow flashing	Supply voltage U_{BK} is present.
				Supply voltage U_M and/or U_S is not present and/or overload or short circuit on U_L.
			Yellow on	Firmware/bus coupler is booting.
			Flashing green/ red	Reset to default settings (reset button is held down)
			Yellow flashing	Firmware update: firmware is being flashed to bus coupler.
			Flashing yellow/ red	Firmware update: incorrect firmware file loaded on the bus coupler.
			Red flashing	Faulty firmware
			Red on	DIP switch configuration is invalid.
			Off	Bus coupler is not ready to operate.
				Supply voltage U_{BK} is not present.
RUN	Green	Protocol transmission status		
		Autobaud/LSS	Flashing	Automatic baud rate detection or LSS services are active.
		Pre-operational	Flashing	The bus coupler is ready to operate. It is in the “Pre-operational” state.
		Stopped	1 x flashing	The bus coupler is in the “Stopped” state. No communication possible.
		Program/firmware download	3 x flashing	A firmware update is running on the device.
		Operational	On	The bus coupler is running. It is in the “Operational” state.
			Off	Firmware is not yet started up completely

Designation	Color	Meaning	State	Description
ERR	Red	Protocol transmission status and error		
		No error	Off	Bus coupler is ready to operate.
		Autobaud/LSS	Flashing	Automatic baud rate detection or LSS services are active.
		Invalid configu-ration	Flashing	General configuration error.
		Warning limit reached	1 x flashing	At least one error counter has reached the warning level.
		Error control event	2 x flashing	A guard event or heartbeat event has been triggered.
		Sync error	3 x flashing	A synchronization error has occurred. No sync telegrams were received during the set monitoring time.
		Event-timer error	4 x flashing	An event-timer error has occurred. The bus coupler received no PDO within the set event time.
		Bus off	On	The bus coupler is in the “Bus off” state.

9.2 Alarm messages and diagnostic objects

For more detailed information, please refer to the bus coupler user manual.

Alarm message (emergency message)

The CANopen® bus coupler generates an alarm message in the event of an error. This alarm message contains the Inline status and the number of the faulty module along with other useful information.

Diagnostic information

Diagnostic information is made available through several mechanisms. The alarm message (emergency message) and the Service Data Objects (SDOs) enable the status of the Inline station to be read.

Index (hex)	Object name	Meaning
1001	Error register	This object index can be used to receive the manufacturer-specific bit 7 using an SDO. This bit indicates an error in the Inline station. You can use this bit or an alarm message to retrieve further diagnostic information.
1002	Manufacturer status register	Manufacturer-specific status of the Inline station and the number of the faulty Inline module.
1003	Pre-defined error field	Up to the last ten errors (subindices). Subindex 0: total number of available errors in the stack.
3101	Station status	Current status of the Inline station. See the following table for meaning of the bits.
3102	Inline faulted module	Number of the currently faulty Inline module.
310C	Inline fault (latched)	Latches and indicates the last Inline station status (low byte). The same bit meaning as 3101_{hex} (station status) except that the bits are latched.
310D	Inline faulted module (latched)	Latches and indicates the number of the last faulty Inline module. The same bit meaning as the 3103_{hex} (faulted module) except that the module number is latched.

Object index 3101_{hex}, station status, bit meanings

Bit	Meaning
0	CRC error
1	Peripheral fault
2	Power error
3	Error: module change
4	Error: local bus inactive
5	Inline connection error
6	Mode: faulted cycles
7	Reserved

In the Operational state, an error in the Inline station always generates an alarm message. By default, due to the settings of the error bits, predefined substitute values (zero by default) are sent to the local outputs. It is possible that diagnostic information may be overwritten due to intermittent error conditions. In this case, we recommend accessing the Predefined error field object, index 1003_{hex}. Each subindex in this object represents a stored error sequence.

10 Auto configuration

When you use DIP switches 1 to 7 to set the device address 0, auto configuration is active. Auto configuration allows for the configuration of the bus coupler without any software support.
It features the following default settings:

Object	Contents
RPDO 1	Digital outputs 1 ... 64
TPDO 1	Digital inputs 1 ... 64
RPDO 2	Analog outputs 1 ... 4
TPDO 2	Analog inputs 1 ... 4
RPDO 3	Analog outputs 5 ... 8
TPDO 3	Analog inputs 5 ... 8
RPDO 4	Analog outputs 9 ... 12
TPDO 4	Analog inputs 9 ... 12

RPDO	Receive process data object	Receive PDO
TPDO	Transmit process data object	Transmit PDO

All other I/O modules will not be mapped during configuration. This also includes function modules. Manually map all unmapped I/O modules to PDO 5 to PDO 32.

In CAN objects 3202_{hex} (IN data COP index) and 3205_{hex} (OUT data COP index), you can read out which index a module is mapped under.

Procedure for auto configuration

To carry out the auto configuration for an installed station, proceed as follows:

- Disconnect the power to the bus coupler.
- Set DIP switches 1 to 7 on the bus coupler, which are used to set the device address, to 0.
- Switch the bus coupler supply voltages (U_{BK}, U_M, and U_S) and the connected I/O terminals on.
  If the RDY LED on the bus coupler permanently lights up green, the I/O configuration is stored in the Flash memory of the station.
- Disconnect the power to the bus coupler.

To switch to normal operation, proceed as follows:

- Set the desired switch setting for the device address, transmission speed, and termination resistor.
- Switch the supply voltages on.

You also have the option of triggering auto configuration by sending an SDO.

For more detailed information, please refer to the bus coupler user manual.

11 Reset button

There is a reset button on the bus coupler.

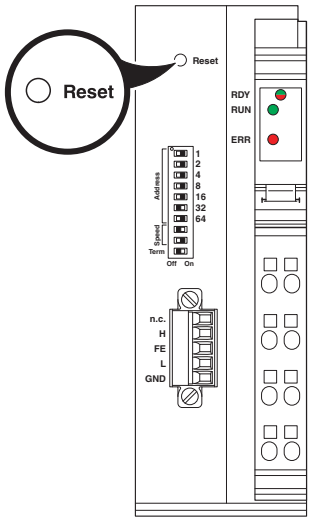


Figure 6 Reset button

The reset button has two functions:

– Restarting the bus coupler
– Resetting of the default settings

11.1 Restarting the bus coupler

Restart the bus coupler by pressing the reset button during ongoing operation.

The outputs of the station are reset.

The process image of the inputs is not re-read.

The bus coupler restarts.

11.2 Restoring the default settings

If you wish to restore the default settings, proceed as follows:

- Disconnect the power to the module.
- Press and hold the reset button.
- Switch on the power.
- Release the button when the ERR RDY flashes briefly for the **first** time (after max. 2 seconds).

The default settings are restored.

If you press the reset button too long and the ERR RDY flashes a second time, you have exited the mode for restoring the default settings. In this case, disconnect power to the module again and proceed as described above.

12 Behavior in the event of an error

12.1 Objects for controlling the output behavior in the event an error

Objects 1029_{hex} and 3002_{hex} to $300A_{hex}$ enable output behavior control in the event of various errors.

Index (hex)	Object name
1029	Error behaviour
3003 ... 300A	... fault mode
3002	Inline fault mode

For more detailed information, please refer to the bus coupler user manual.

12.2 Inline fault mode

If a local error occurs, the outputs are automatically switched off.

Inline fault mode	Meaning
0	Stop running data cycles on fault.
1	Auto restart (default)
2	Go to fault state.
3	Continue on fault.

For more detailed information, please refer to the bus coupler user manual.

12.3 Error states

In the case of digital and analog outputs, the bus coupler supports standard CANopen® error modes and substitute values.

Digital output support

- Hold last state
- Turn off during a faulted condition (default)
- Turn on during a faulted condition

Analog output support

- Hold last value
- Set to the value which is defined by the object 6444_{hex} (analog output error value) (default).
  The default value in the object 6444_{hex} is 0_{hex}.

13 Firmware update

You can update the firmware on the bus coupler via the network, if required.

The bus coupler supports a CiA-compliant mechanism for this according to CiA standard 302.

You can use the “CANopen® UpdateManager” software tool for this, for example. For information about this tool, visit http://www.emtas.de/en/produkte/canopen-update-manager.

For the firmware update, a CAN/USB adapter (e.g., PEAK PCAN-USB) must be used as the hardware interface.

The firmware update procedure is described in the IL CO BK(-XC)-PAC - FW UPDATE application note, see ordering data.

14 Supported objects

For a detailed description of the objects, please refer to the bus coupler user manual.

Abbreviations used in the following tables

R	Read
R/W	Read/write
R/W/W	Read/write/write - can be mapped to an input data object
const	Constant
M	Mandatory
O	Optional
C	Conditional

14.1 Communication-profile-specific objects

Standard objects

Index (hex)	Object	Name	Data type	Access	M/O
1000	Var	Device type	UINT32	R	M
1001	Var	Error register	UINT8	R	M
1002	Var	Manufacturer status register	UINT32	R	O
1003	Var	Pre-defined error field	UINT32	R	O
1005	Var	COB-ID SYNC message	UINT32	R/W	O
1008	Var	Manufacturer device name	Visible String	const	O
1009	Var	Manufacturer hardware version	Visible String	const	O
100A	Var	Manufacturer software version	Visible String	const	O
100C	Var	Guard time	UINT16	R/W	O
100D	Var	Life time factor	UINT8	R/W	O
1010	Array	Store parameters	UINT32	R/W	O
1011	Array	Restore default parameters	UINT32	R/W	O
1012	Var	COB-ID time stamp	UINT32	R/W	O
1014	Var	COB-ID emergency message	UINT32	R/W	O
1015	Var	Inhibit time EMCY	UINT16	R/W	O
1016	Array	Consumer heartbeat time	UINT32	R/W	O
1017	Var	Producer heartbeat time	UINT16	R/W	O
1018	Record	Identity object	Identity (23_{hex})	R	M
1020	Array	Verify configuration	UINT32	R/W	O
1027	Array	Module list	UINT16	R	O
1029	Array	Error behaviour	UINT8	R/W	O

Server SDO parameter

Index (hex)	Object	Name	Data type	Access	M/O
1200	Record	1st server SDO parameter	SDO Par. (22_{hex})	R	O
1201	Record	2nd server SDO parameter	SDO Par. (22_{hex})	R/W	O

Client SDO parameter

Not supported

RPDO communication parameter

Index (hex)	Object	Name	Data type	Access	M/O
1400	Record	1st RPDO communication parameter	PDO CommPar (20_{hex})	R/W	M/O
1401	Record	2nd RPDO communication parameter	PDO CommPar (20_{hex})	R/W	M/O
...	...	...	...	...	...
141F	Record	32nd RPDO communication parameter	PDO CommPar (20_{hex})	R/W	M/O

RPDO mapping parameter

Index (hex)	Object	Name	Data type	Access	M/O
1600	Record	1st RPDO mapping parameter	PDO Mapping (21_{hex})	R/W	M/O
1601	Record	2nd RPDO mapping parameter	PDO Mapping (21_{hex})	R/W	M/O
...	...	...	...	...	...
1061F	Record	32nd RPDO mapping parameter	PDO Mapping (21_{hex})	R/W	M/O

TPDO communication parameter

Index (hex)	Object	Name	Data type	Access	M/O
1800	Record	1st TPDO communication parameter	PDO CommPar (20_{hex})	R/W	M/O
1801	Record	2nd TPDO communication parameter	PDO CommPar (20_{hex})	R/W	M/O
...	...	...	...	...	...
181F	Record	32nd TPDO communication parameter	PDO CommPar (20_{hex})	R/W	M/O

TPDO mapping parameter

Index (hex)	Object	Name	Data type	Access	M/O
1A00	Record	1st TPDO mapping parameter	PDO Mapping (21_{hex})	R/W	M/O
1A01	Record	2nd TPDO mapping parameter	PDO Mapping (21_{hex})	R/W	M/O
...	...	...	...	...	...
1A1F	Record	32nd TPDO mapping parameter	PDO Mapping (21_{hex})	R/W	M/O

14.2 Manufacturer-specific I/O objects

Index (hex)	Object	Name	Data type	Access
2000	Array	Digital input latch enable (8 bits)	UINT8	R/W
2001	Array	Digital input latch state (8 bits)	UINT8	R/W
2400	Array	Analog input range, remanent	UINT16	R/W
2401	Array	Analog input range, mapping	UINT16	R/W
2410	Array	Analog output response	UINT16	R/W

14.3 Inline configuration objects

Index (hex)	Object	Name	Data type	Access
3000	Var	Reconfigure I/O	Boolean	R/W
3002	Var	Inline fault mode	UINT8	R/W
3003	Var	Inline CRC fault mode	UINT8	R/W
3004	Var	Inline peripheral fault mode	UINT8	R/W
3005	Var	Inline power fault mode	UINT8	R/W
3006	Var	Inline module change fault mode	UINT8	R/W
3007	Var	Inactive local bus fault mode	UINT8	R/W
3008	Var	Inline connection fault mode	UINT8	R/W
3009	Var	Inline faulted cycles mode	UINT8	R/W
300A	Var	Processor power fault mode	UINT8	R/W
300F	Var	Erase configuration	UINT8	R/W

14.4 Inline interface objects

Index (hex)	Object	Name	Data type	Access
3101	Var	Station status	UINT16	R
3102	Var	Inline faulted module	UINT8	R
3103	Var	Inline error max retry	UINT8	R/W
3104	Var	Inline number of modules	UINT8	R
3105	Var	Inline count of bits	UINT16	R
3106	Var	Inline count of bytes	UINT16	R
3109	Var	Inline Loop diagnostic count	UINT16	R
310A	Var	Inline first faulted module	UINT8	R
310B	Var	Inline last faulted module	UINT8	R
310C	Var	Inline fault (latched)	UINT8	R
310D	Var	Inline faulted module (latched)	UINT8	R/W
310E	Var	Inline first faulted module (latched)	UINT8	R
310F	Var	Inline last faulted module (latched)	UINT8	R
3110	Var	Inline power status	UINT8	R
3111	Var	Inline interface control byte	UINT8	R/W

14.5 Inline module objects

Index (hex)	Object	Name	Data type	Access
3200	Array	Inline module ID (stored)	UINT16	R
3201	Array	Inline module ID (current)	UINT16	R
3202	Array	Inline module IN data index	UINT16	R
3203	Array	Inline module IN data first subindex	UINT8	R
3204	Array	Inline module IN data last subindex	UINT8	R
3205	Array	Inline module OUT data index	UINT16	R
3206	Array	Inline module OUT data first index	UINT8	R
3207	Array	Inline module OUT data last subindex	UINT8	R

14.6 Inline function module objects

Index (hex)	Object	Name	Data type	Access
3300	Array	Special function data size	UINT8	R
3301	Array	Special function status	Boolean	R
3302	Array	Special function IN data (1 byte)	UINT8	R
3303	Array	Special function OUT data (1 byte)	UINT8	R/W/W
3304	Array	Special function IN data (2 bytes)	UINT16	R
3305	Array	Special function OUT data (2 bytes)	UINT16	R/W/W
3306	Array	Special function IN data (3 bytes)	Unsigned 24	R
3307	Array	Special function OUT data (3 bytes)	Unsigned 24	R/W/W
3308	Array	Special function IN data (4 bytes)	UINT32	R
3309	Array	Special function OUT data (4 bytes)	UINT32	R/W/W
330A	Array	Special function IN data (6 bytes)	Unsigned 48	R
330B	Array	Special function OUT data (6 bytes)	Unsigned 48	R/W/W
330C	Array	Special function IN data (8 bytes)	UINT64	R
330D	Array	Special function OUT data (8 bytes)	UINT64	R/W/W
330E	Array	Special function IN data (>8 bytes)	UINT8	R
330F	Array	Special function OUT data (>8 bytes)	UINT8	R/W/W

14.7 Objects for serial communication

Index (hex)	Object	Name	Data type	Access
3500	Array	Serial module type	UINT8	R
3501	Array	Serial module status	Boolean	R
3502	Array	Serial status word	UINT16	R
3503	Array	Serial control word	UINT16	R/W/W
3504	Array	Serial receive data	DOMAIN	R
3505	Array	Serial transmit data	DOMAIN	R/W/W
3506	Array	Serial receive data fragment	SERIAL_RECEIVE	R
3507	Array	Serial transmit data fragment	SERIAL_TRANSMIT	R/W/W
3508	Array	Serial protocol	UINT8	R/W
3509	Array	Serial baud rate	UINT8	R/W
350A	Array	Serial data width	UINT8	R/W
350D	Array	Serial error pattern	UINT8	R/W
350E	Array	Serial first delimiter	UINT8	R/W
350F	Array	Serial second delimiter	UINT8	R/W
3510	Array	3964R priority	UINT8	R/W
3511	Array	Serial output type	UINT8	R/W
3512	Array	Serial DTR control	UINT8	R/W
3513	Array	Serial rotation switch	UINT8	R/W
3514	Array	Serial XON pattern	UINT8	R/W
3515	Array	Serial XOFF pattern	UINT8	R/W
351C	Array	Serial module enable	Boolean	R/W

14.8 Digital input objects

Index (hex)	Object	Name	Data type	Category
6000	Array	Read input 8 bits	UINT8	C: DI
6005	Var	Global interrupt enable digital 8 bits	Boolean	O
6006	Array	Interrupt mask any change 8 bits	UINT8	O
6100	Array	Read input 16 bits	UINT16	O
6106	Array	Interrupt mask any change 16 bits	UINT16	O
6120	Array	Read input 32 bits	UINT32	O
6126	Array	Interrupt mask any change 32 bits	UINT32	O

14.9 Digital output objects

Index (hex)	Object	Name	Data type	Category
6200	Array	Write output 8 bits	UINT8	
6206	Array	Error mode output 8 bits	UINT8	
6207	Array	Error state output 8 bits	UINT8	
6300	Array	Write output 16 bits	UINT16	
6306	Array	Error mode output 16 bits	UINT16	
6307	Array	Error state output 16 bits	UINT16	
6320	Array	Write output 32 bits	UINT32	
6326	Array	Error mode output 32 bits	UINT32	
6327	Array	Error state output 32 bits	UINT32	

14.10 Analog input objects

Index (hex)	Object	Name	Data type	Category
6400	Array	Read analog input 8 bits	INT8	O
6401	Array	Read analog input 16 bits	INT16	C: AI

14.11 Analog output objects

Index (hex)	Object	Name	Data type	Category
6410	Array	Write analog output 8 bit	INT8	O
6411	Array	Write analog output 16 bit	INT16	C: AO

14.12 Analog input configuration objects

Index (hex)	Object	Name	Data type	Category
6421	Array	Analog input interrupt trigger selection	UINT8	O
6423	Var	Analog input global interrupt enable	Boolean	C: AI
6424	Array	Analog input interrupt upper limit integer	INT32	O
6425	Array	Analog input interrupt lower limit integer	INT32	O
6426	Array	Analog input interrupt delta unsigned	UINT32	O

14.13 Analog output configuration objects

Index (hex)	Object	Name	Data type	Category
6443	Array	Analog output error mode	UINT8	O
6444	Array	Analog output error value integer	INT32	O

14.14 PCP interface objects

Index (hex)	Object	Name	Data type	Access
3400	Array	PCP PDU size	UINT8	R
3401	Array	PCP module channel size	UINT8	R
3402	Array	PCP module status	UINT8	R
3403	Array	PCP request	DOMAIN	R/W
3404	Array	PCP response	DOMAIN	R
3405	Array	PCP module number	UINT8	R/W
3406	Array	PCP write index	UINT16	R/W
3407	Array	PCP write subindex	UINT8	R/W
3408	Array	PCP write data	DOMAIN	R/W
3409	Array	PCP read index	UINT16	R/W
340A	Array	PCP read subindex	UINT8	R/W
340B	Array	PCP read data	DOMAIN	R
340C	Array	PCP request fragment	PCP_FRAG_REQUEST	R/W
340D	Array	PCP response fragment	PCP_FRAG_RESPONSE	R
340E	Array	PCP write invoke ID	UINT8	R/W
340F	Array	PCP read invoke ID	UINT8	R/W
3410	Array	PCP write data confirmation	DOMAIN	R
3411	Array	PCP read data confirmation	DOMAIN	R

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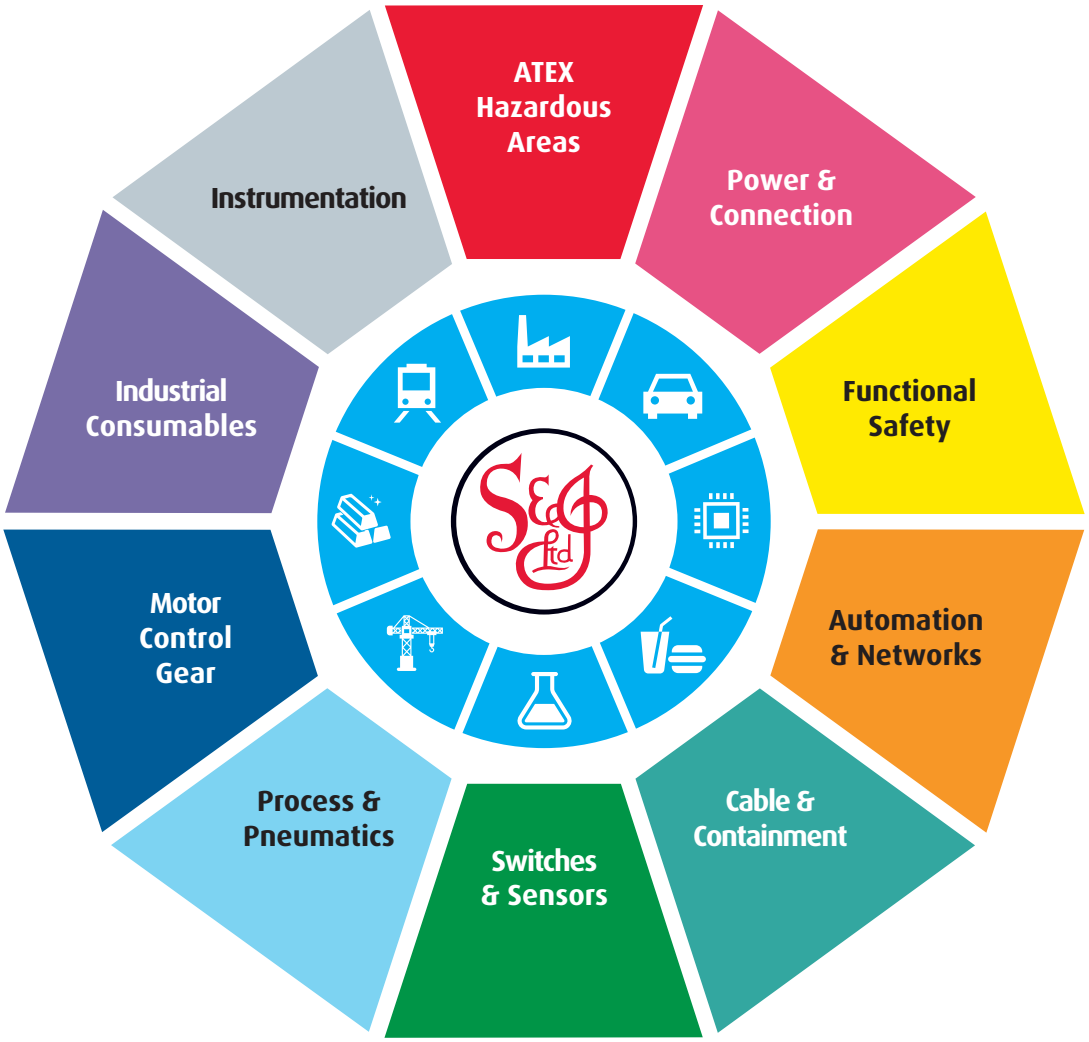

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