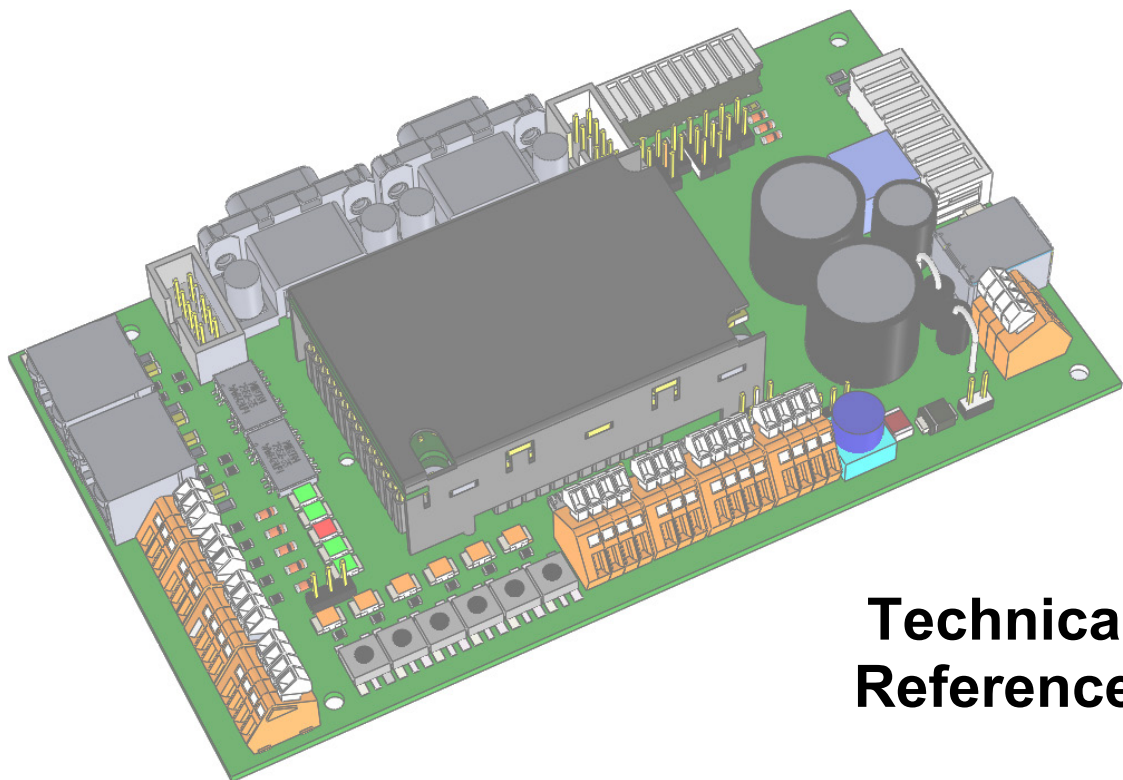


# **IO iPOS4808MY**

**v0.1C  
I/O Board for  
iPOS4808 MY  
Intelligent  
Servo Drives**



T E C H N O S O F T



## **Technical Reference**

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## Read This First

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### About This Manual

This book is a technical reference manual for the **IO-iPOS4808 MY** extension boards **version 0.1C** that are included in the **iPOS4808MY** intelligent servo drives starter kits.

The **IO iPOS4808MY** extension board is compatible with the following products:

<b>iPOS4808 MY-CAN v20</b>	p/n P027.414.E101	For drives with CAN without STO inputs
<b>iPOS4808 MY-CAN-STO</b>	p/n P027.314.E111 or P027.324.E111	For drives with CAN and STO inputs
<b>iPOS4808 MY-CAT-STO</b>	p/n P027.314.E121	For drives with EtherCAT and STO inputs

**Paragraph 2.4 shows how to quickly identify the IO-iPOS4808MY version. If your IO-iPOS4808MY is an older version, you can find the appropriate manual on the Technosoft web page.**

### Notational Conventions

This document uses the following conventions:

**iPOS4808** – any iPOS4808 MY-CAN or CAT drive that can be connected to this I/O board

**TML** – Technosoft Motion Language

### Related Documentation

**iPOS4808 MY Technical Reference (**

**part no. P027.414.E101.iPOS4808.MY-CAN.DSH**

**P027.314.E111.iPOS4808.MY-CAN-STO.DSH**

**P027.314.E121.iPOS4808.MY-CAT-STO.DSH )**

– describes the hardware connections of the iPOS4808 MY family of intelligent servo drives including the technical data and connectors.

**Help of the EasySetUp software** – describes how to use **EasySetUp** to quickly setup any Technosoft drive for your application using only 2 dialogues. The output of EasySetUp is a set of setup data that can be downloaded into the drive EEPROM or saved on a PC file. At power-on, the drive is initialized with the setup data read from its EEPROM. With EasySetUp it is also possible to retrieve the complete setup information from a drive previously programmed. EasySetUp includes a firmware programmer with allows you to update your drive firmware to the latest revision. **EasySetUp can be downloaded free of charge from Technosoft web page**

**Motion Programming using EasyMotion Studio (part no. P091.034.ESM.UM.xxxx)** – describes how to use the EasyMotion Studio to create motion programs using in Technosoft Motion Language (TML). EasyMotion Studio platform includes **EasySetUp** for the drive/motor setup, and a **Motion Wizard** for the motion programming. The Motion Wizard provides a simple, graphical way of creating motion programs and automatically generates all the TML

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instructions. *With EasyMotion Studio you can fully benefit from a key advantage of Technosoft drives – their capability to execute complex motions without requiring an external motion controller, thanks to their built-in motion controller. A demo version of EasyMotion Studio (with EasySetUp part fully functional) can be downloaded free of charge from Technosoft web page*

**iPOS CANopen Programming (part no. P091.063.iPOS.UM.xxxx)** – explains how to program the iPOS drives using **CANopen** protocol and describes the associated object dictionaries for the supported profiles.

**CAN application layer over EtherCAT Programming (part no. P091.064.UM.xxxx)** – explains how to program the Technosoft intelligent drives using **CoE** protocol and describes the associated object dictionary.

**TML\_LIB v2.0 (part no. P091.040.v20.UM.xxxx)** – explains how to program in **C, C++, C#, Visual Basic or Delphi Pascal** a motion application for the Technosoft intelligent drives using TML\_LIB v2.0 motion control library for PCs. The TML\_lib includes ready-to-run examples that can be executed on **Windows or Linux** (x86 and x64).

**TML\_LIB LabVIEW v2.0 (part no. P091.040.LABVIEW.v20.UM.xxxx)** – explains how to program in **LabVIEW** a motion application for the Technosoft intelligent drives using TML\_LIB\_Labview v2.0 motion control library for PCs. The TML\_Lib\_LabVIEW includes over 40 ready-to-run examples.

**TML\_LIB\_S7 (part no. P091.040.S7.UM.xxxx)** – explains how to program in a PLC **Siemens series S7-300 or S7-400** a motion application for the Technosoft intelligent drives using TML\_LIB\_S7 motion control library. The TML\_LIB\_S7 library is **IEC61131-3 compatible**.

**TML\_LIB\_CJ1 (part no. P091.040.CJ1.UM.xxxx)** – explains how to program in a PLC Omron series CJ1 a motion application for the Technosoft intelligent drives using TML\_LIB\_CJ1 motion control library for PCs. The TML\_LIB\_CJ1 library is **IEC61131-3 compatible**.

**TML\_LIB\_X20 (part no. P091.040.X20.UM.xxxx)** – explains how to program in a B&R PLC series X20 a motion application for the Technosoft intelligent drives using TML\_LIB\_X20 motion control library for PCs. The TML\_LIB\_X20 library is **IEC61131-3 compatible**

**TechnoCAN (part no. P091.063.TechnoCAN.UM.xxxx)** – presents TechnoCAN protocol – an extension of the CANopen communication profile used for TML commands

### ***If you Need Assistance ...***

<b>If you want to ...</b>	<b>Contact Technosoft at ...</b>
Visit Technosoft online	World Wide Web: <a href="http://www.technosoftmotion.com/">http://www.technosoftmotion.com/</a>
Receive general information or assistance (see Note)	World Wide Web: <a href="http://www.technosoftmotion.com/">http://www.technosoftmotion.com/</a> Email: <a href="mailto:contact@technosoftmotion.com">contact@technosoftmotion.com</a>
Ask questions about product operation or report suspected problems (see Note)	Fax: (41) 32 732 55 04 Email: <a href="mailto:hotline@technosoftmotion.com">hotline@technosoftmotion.com</a>
Make suggestions about, or report errors in documentation.	Mail: Technosoft SA  Avenue des Alpes 20 CH-2000 Neuchatel, NE Switzerland

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# 1 Safety information

Read carefully the information presented in this chapter before carrying out the drive installation and setup! It is imperative to implement the safety instructions listed hereunder.

This information is intended to protect you, the drive and the accompanying equipment during the product operation. Incorrect handling of the drive can lead to personal injury or material damage.

Only qualified personnel may install, setup, operate and maintain the drive. A “qualified person” has the knowledge and authorization to perform tasks such as transporting, assembling, installing, commissioning and operating drives.

The following safety symbols are used in this manual:



**WARNING!**

***SIGNALS A DANGER TO THE OPERATOR WHICH MIGHT CAUSE BODILY INJURY. MAY INCLUDE INSTRUCTIONS TO PREVENT THIS SITUATION***



**CAUTION!**

***SIGNALS A DANGER FOR THE DRIVE WHICH MIGHT DAMAGE THE PRODUCT OR OTHER EQUIPMENT. MAY INCLUDE INSTRUCTIONS TO AVOID THIS SITUATION***



**CAUTION!**

***Indicates areas SENSITIVE TO electrostatic discharges (ESD) WHICH REQUIRE HANDLING IN AN ESD PROTECTED ENVIRONMENT***

## 1.1 Warnings



**WARNING!**

***THE VOLTAGE USED IN THE DRIVE MIGHT CAUSE ELECTRICAL SHOCKS. DO NOT TOUCH LIVE PARTS WHILE THE POWER SUPPLIES ARE ON***



**WARNING!**

***TO AVOID ELECTRIC ARCING AND HAZARDS, NEVER CONNECT / DISCONNECT WIRES FROM THE DRIVE WHILE THE POWER SUPPLIES ARE ON***



**WARNING!**

***THE DRIVE MAY HAVE HOT SURFACES DURING OPERATION.***



**WARNING!**

***DURING DRIVE OPERATION, THE CONTROLLED MOTOR WILL MOVE. KEEP AWAY FROM ALL MOVING PARTS TO AVOID INJURY***

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## 1.2 Cautions



**CAUTION!**

***THE POWER SUPPLIES CONNECTED TO THE DRIVE MUST COMPLY WITH THE PARAMETERS SPECIFIED IN THIS DOCUMENT***



**CAUTION!**

***TROUBLESHOOTING AND SERVICING ARE PERMITTED ONLY FOR PERSONNEL AUTHORISED BY TECHNOSOFT***



**CAUTION!**

***THE DRIVE CONTAINS ELECTROSTATICALLY SENSITIVE COMPONENTS WHICH MAY BE DAMAGED BY INCORRECT HANDLING. THEREFORE THE DRIVE SHALL BE REMOVED FROM ITS ORIGINAL PACKAGE ONLY IN AN ESD PROTECTED ENVIRONMENT***

To prevent electrostatic damage, avoid contact with insulating materials, such as synthetic fabrics or plastic surfaces. In order to discharge static electricity build-up, place the drive on a grounded conductive surface and also ground yourself.

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## 2 Product Overview

### 2.1 Introduction

The **IO-iPOS4808MY** extension board is an auxiliary module allowing rapid evaluation of the **iPOS4808 MY-CAN** or **iPOS4808 MY-CAT**, Intelligent Servo Drives.

### 2.2 Key Features

- Motor supply: +11.... +50 V<sub>DC</sub>
- Logic supply: +9.... +36 V<sub>DC</sub>
- STO supply: +18.... +40 V<sub>DC</sub> (if available on the drive)
- Direct access to the following iPOS4808 I/O signals, via spring type terminals connectors:
  - 6 digital inputs, 12-36V (PNP or NPN):
    - 4 general – purpose inputs: IN0, IN1, IN4 and IN5
    - 2 limit switch inputs: IN2/LSP (positive) and IN3/LSN (negative)
  - 5 digital outputs, 5-36V, 0.5A (NPN open-collector/TTL pull-up):
    - 3 general-purpose outputs: OUT0, OUT1, OUT4
    - One Error output: OUT2/Error
    - One Ready output: OUT3/Ready
  - 2 analog inputs, 0-5V, 12-bit used to read:
    - One analogue Reference: REF or general purpose
    - One analogue Feedback sensor: FDBK or general purpose
- Emulation of external PNP/NPN inputs commutation via 6 push-buttons connected to inputs: IN0/home, IN1, IN2/LSP, IN3/LSN, IN4, IN5
- Emulation of external analogue command via potentiometer VR1, connectable to REF or FDBK
- USB B connector for communication with the PC
- One spring type terminal block connector for CAN communication
- One spring type terminal block connector for STO inputs (if available on the drive)
- Two RJ 45 for EtherCAT communication<sup>1</sup>
- Feedback #1 available connectors:
  - 2x5 pin shrouded header, 2.54mm pitch
  - HDB15
  - 10 pin connector for pluggable terminal block with 2.5mm pin spacing
- Feedback #2 available connectors:
  - 2x5 pin shrouded header, 2.54mm pitch
  - HDB15

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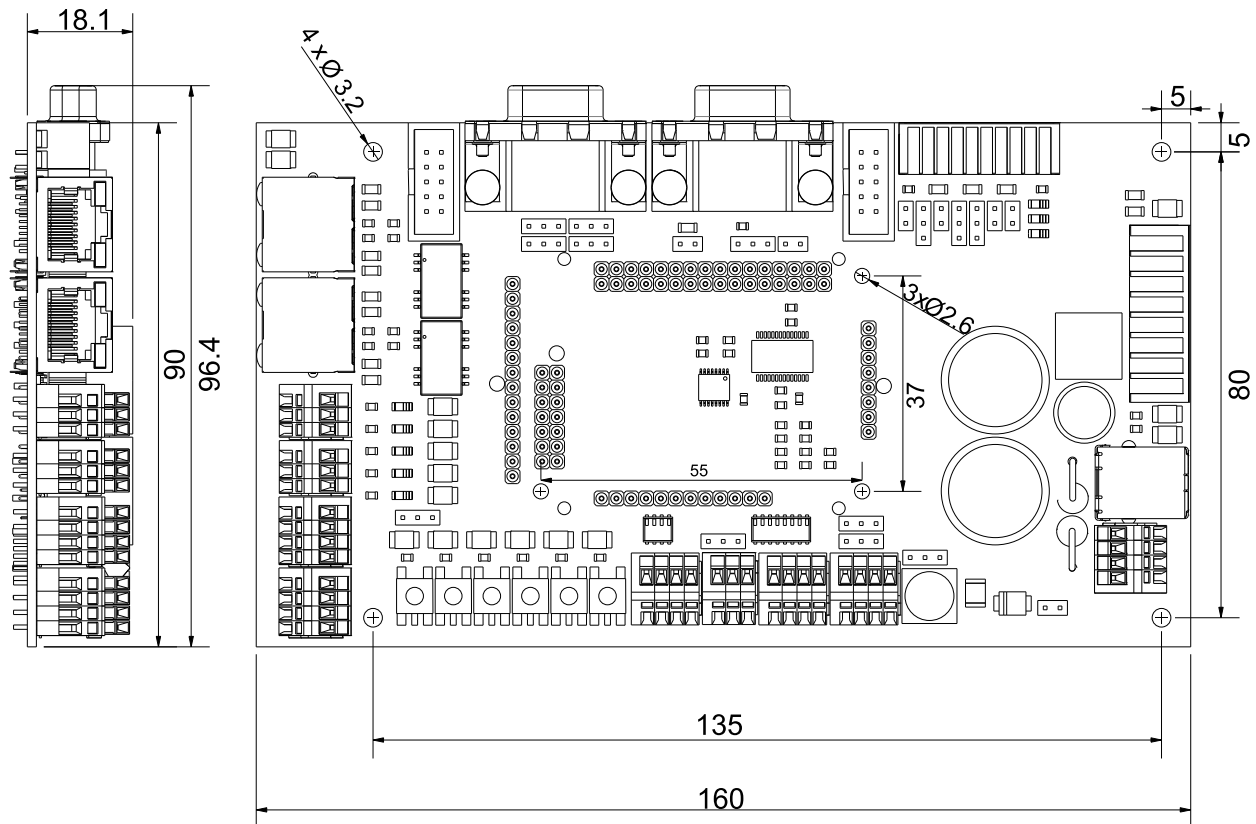
<sup>1</sup> Usable only when the -CAT drive is present.



### 2.3 IO-iPOS4808MY Board Dimensions

**Figure 2.3.1** presents the IO-iPOS4808 board dimensions.

All dimensions are in mm.

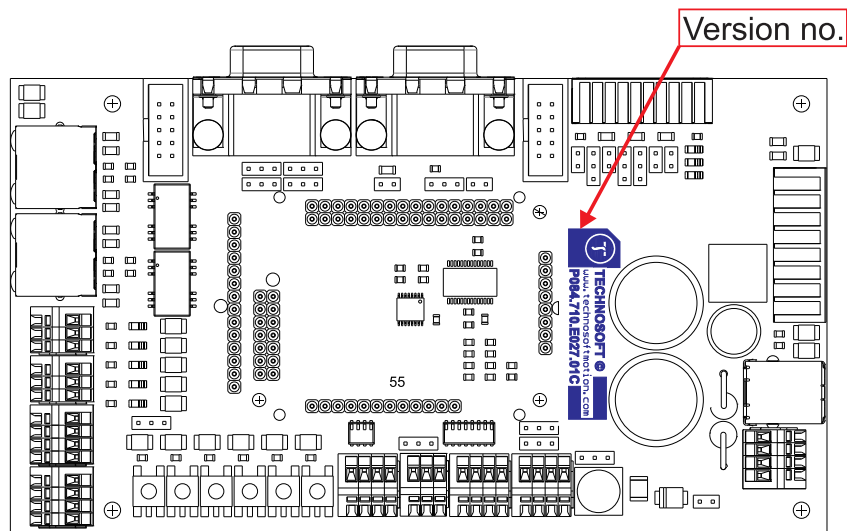


**Figure 2.3.1. IO-iPOS4808MY board dimensions**

## 2.4 IO-iPOS4808MY Board Version Identification

Figure 2.4.1 shows how to identify the IO-iPOS4808MY board version.

This manual refers to IO-iPOS4808 **version 0.1C**.

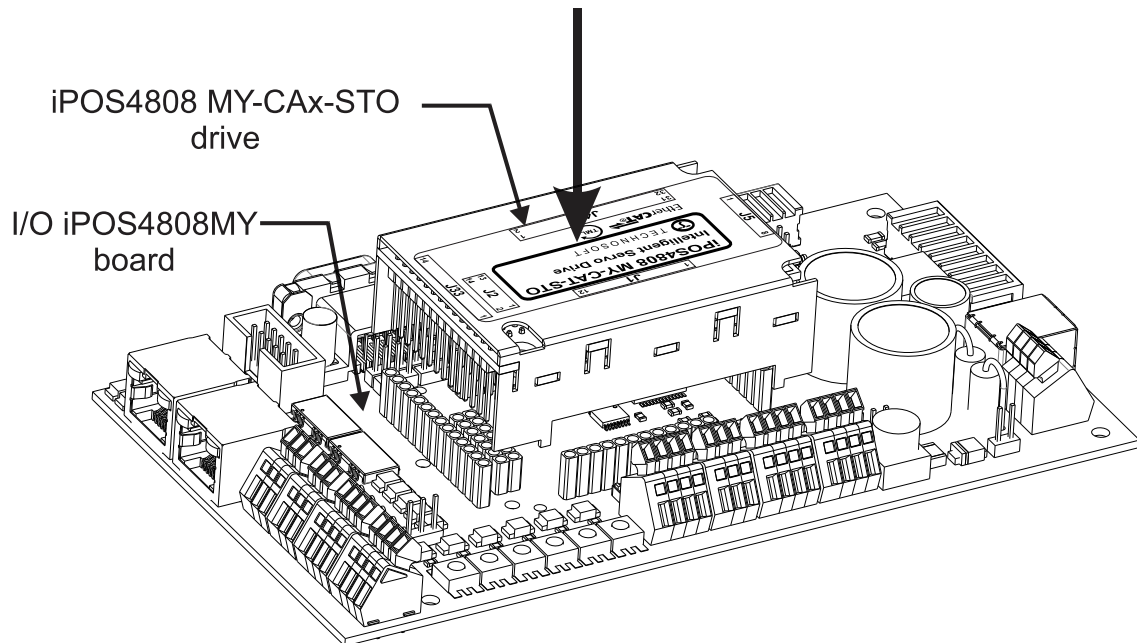


**Figure 2.4.1. IO-iPOS4808MY V0.1C board version identification**

## 3 Hardware Installation

### 3.1 Mounting the iPOS4808 MY-CAx-STO

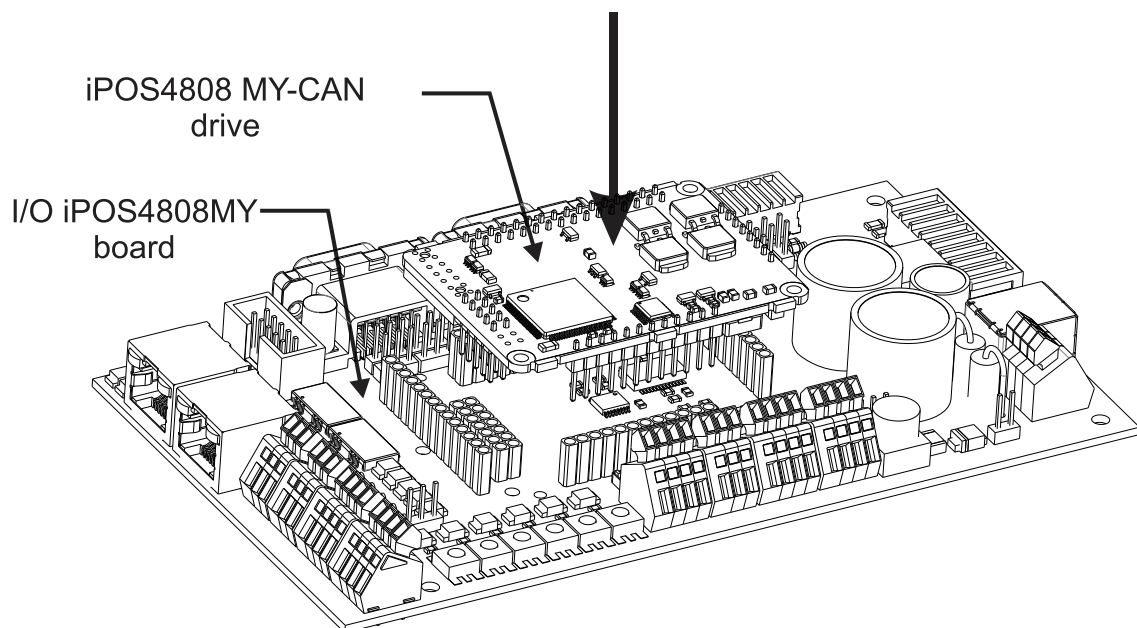
Push down the iPOS4808 MY drive into the IO-iPOS4808MY board. J1,2,4,5 and 33 of the MY into J1,2,4,5 and 33 of the IO.



**Figure 3.1.1** Installing an iPOS4808 MY-CAN/CAT-STO drive in the IO-iPOS4808MY

### 3.2 Mounting the iPOS4808 MY-CAN

Push down the iPOS4808 MY drive into the IO-iPOS4808MY board. J1,2,4,5 of the MY into J1,2,4,5 of the IO.



**Figure 3.2.1** Installing an iPOS4808 MY-CAN/CAT-STO drive in the IO-iPOS4808MY

### 3.3 Connectors

#### 3.3.1 Connectors Layout and Description

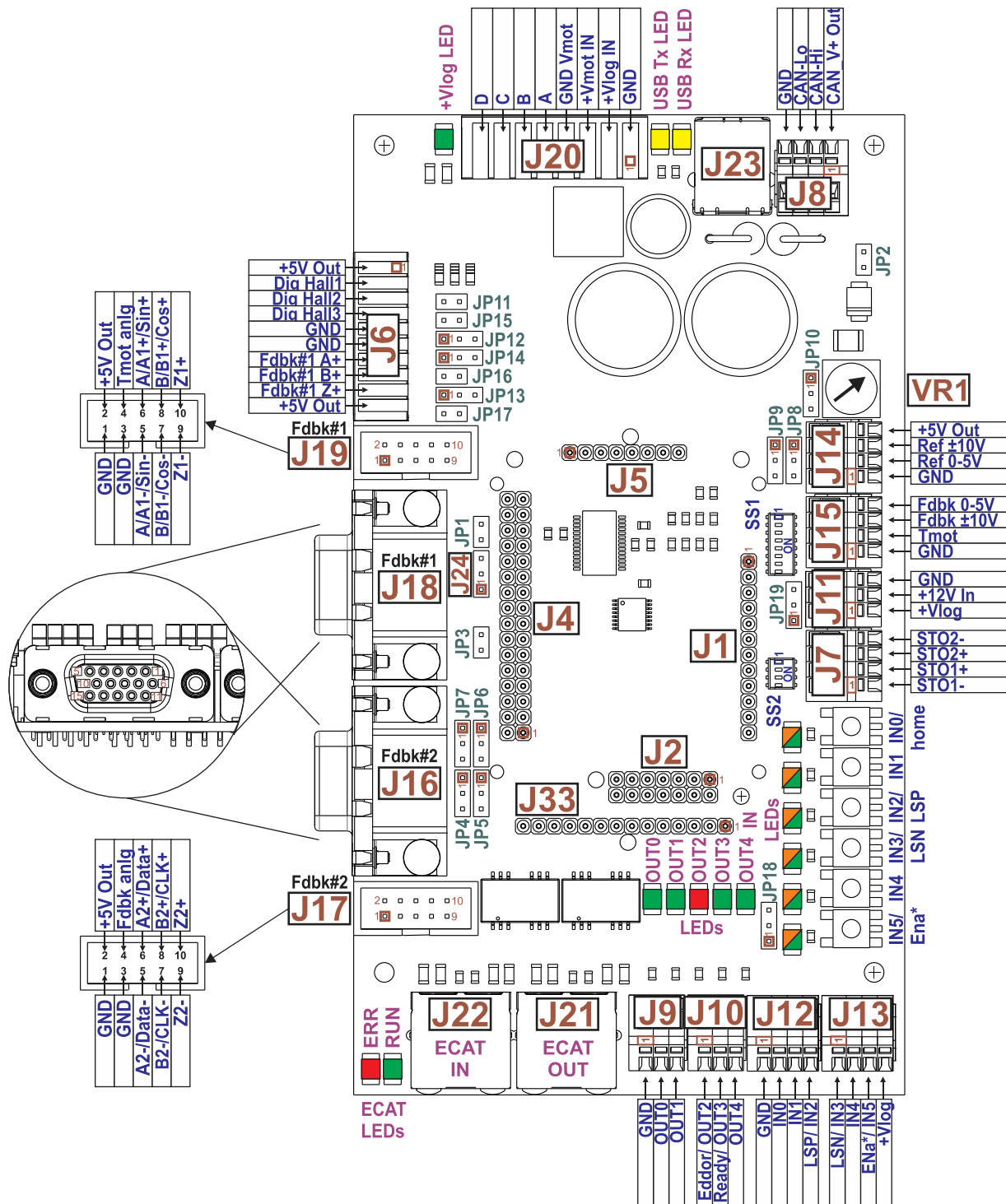


Figure 3.3.1. Top view of the IO-iPOS4808MY extension board

\*IN5 is used as the Enable input if the drive does not have STO inputs

### 3.3.2 J6 – Feedback#1 single ended and Digital hall connector

Pin	Pin name	Type	Function
1	+5ViPOS	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)
2	HALL1	I	Hall 1 digital sensor input
3	HALL2	I	Hall 2 digital sensor input
4	HALL3	I	Hall 3 digital sensor input
5	GND	-	Ground
6	GND	-	Ground
7	A1	I	Incremental encoder A1 single-ended encoder
8	B1	I	Incremental encoder B1 single-ended encoder
9	Z1	I	Incremental encoder Z1 (index) single-ended
10	+5V iPOS	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)

**Remarks:**

- Feedback#1 signals are also available at J18 and J19 connectors.
- When using pins 7,8,9, JP15,16,17 must be OFF

### 3.3.3 J7 – STO (Safe Torque Off) connector

Pin	Pin name	Type	Function
1	STO1-	I	Safe Torque Off input 1, negative return (opto-isolated, 0V)
2	STO1+	I	Safe Torque Off input 1, positive input (opto-isolated, 18÷40V)
3	STO2+	I	Safe Torque Off input 2, positive input(opto-isolated, 18÷40V)
4	STO2-	I	Safe Torque Off input 2, negative return (opto-isolated, 0V)

Apply between both STO1+, STO2+ and STO1-, STO2- 24V DC for motor PWM output operation

**Remarks:**

- This connector is valid only for drives with STO inputs.
- The STO inputs can be bypassed using the SS2 sliding switch functions.

### 3.3.4 J8 – CAN connector

Pin	Pin name	Type	Function
1	CAN_V+	O	If JP2 = 1, +V <sub>LOG</sub> will be connected to this pin
2	CAN-Hi	I/O	CAN-Bus positive line (positive during dominant bit)
3	CAN-Lo	I/O	CAN-Bus negative line (negative during dominant bit)
4	GND	-	Ground

**Remarks:**

1. Connect the JP3 jumper to add an 120Ω terminal resistor in your CAN network. Leave JP3 open if the network already has terminal resistors.
2. Connect JP2 jumper to connect the IOiPOS4808MY logic supply +V<sub>LOG</sub> to CAN\_V+. Leave open if the network already has a separate supply connected to CAN\_V+.

### 3.3.5 J9 – Digital outputs connector

Pin	Pin name	Type	Function
1	GND	-	Ground
2	OUT0	O	General-purpose/ digital output OUT0
3	OUT1	O	General-purpose/ digital output OUT1

### 3.3.6 J10 – Digital outputs connector

Pin	Pin name	Type	Function
1	OUT2/ Error	O	Drive error digital output OUT2/Error
2	OUT3/ Ready	O	Drive ready digital output OUT3/Ready
3	OUT4	O	General-purpose/ digital output OUT4

### 3.3.7 J11 – Supply I/O connector

Pin	Pin name	Type	Function
1	+V <sub>LOG</sub>	I/O	Logic supply: +9 to +36V <sub>DC</sub> ; Internally connected to all +V <sub>LOG</sub> pins
2	+12V In	I	External supply input. Internally connected to J16 pin 6.
3	GND	-	Ground

### 3.3.8 J12 – Digital inputs connector

Pin	Pin name	Type	Function
1	GND	-	Ground
2	IN0	I	General-purpose digital input IN0
3	IN1	I	General-purpose digital input IN1
4	IN2/ LSP	I	Positive limit switch digital input IN2/LSP

### 3.3.9 J13 – Digital inputs connector

Pin	Pin name	Type	Function
1	LSN	I	Negative limit switch digital input IN3/LSN
2	IN4	I	General-purpose digital input IN4
3	IN5/ ENA	I	Drive enable digital input IN5. If the drive does not have STO inputs, the pin is used as Drive Enable
4	+V <sub>LOG</sub>	I/O	Logic supply: +9 to +36V <sub>DC</sub> ; Internally connected to all +V <sub>LOG</sub> pins

### 3.3.10 J14 – Analog inputs connector

Pin	Pin name	Type	Function
1	GND	-	Ground
2	Ref 0-5V	I	External analogue reference signal (mono-polar 0 to +5V )
3	Ref ±10V	I	External analogue reference signal (bipolar -10V to +10V )
4	+5V Out	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)

### 3.3.11 J15 – Analog inputs connector

Pin	Pin name	Type	Function
1	GND	-	Ground
2	Temp Mot	I	NTC/PTC input. Used to read an analog temperature value
3	Fdbk $\pm 10V$	I	External analogue feedback signal (bipolar -10V to +10V )
4	Fdbk 0-5V	I	External analogue feedback signal (mono-polar 0 to +5V )

### 3.3.12 J16 – Feedback #2 connector (DB15)

Pin	Pin name	Type	Function
1	+5V Out	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)
2	DT+/SL+	I/O	Data+ diff. input for SSI; or Slave+ for BiSS encoders
3	DT-/SL-	I/O	Data- diff. input for SSI; or Slave- for BiSS encoders
4	B2+/Dir+	I	Incr. encoder2 B+ diff. input, or Dir+ diff input
5	A2+/Pulse+	I	Incr. encoder2 A+ diff. input, or Pulse+ diff. input
6	+12V Out	O	External power supply output for encoders which require other voltages than +5V. Internally connected to J11 pin 2 where the external supply can be connected.
7	CLK+/MA+	I/O	Clock+ diff. input for SSI encoders; or Master+ for BiSS encoders
8	CLK-/MA-	I/O	Clock- diff. input for SSI encoders; or Master- for BiSS encoders
9	Z2+	I	Incr. encoder2 Z+ diff. input
10	Z2-	I	Incr. encoder2 Z- diff. input
11	GND	-	Return ground for sensors supply
12	FDBK	I	Analogue input, 12-bit, 0-5V. Used to read an analogue position or speed feedback (as tacho), or used as general purpose analogue input
13	n.c.	-	not connected
14	B2-/Dir-	I	Incr. encoder2 B- diff. input, or Dir- diff input
15	A2-/Pulse-	I	Incr. encoder2 A- diff. input, or Pulse- diff input

**Remark:** Feedback#2 signals are also available at J17.

### 3.3.13 J17 – Feedback #2 connector (2x5 pin)

Pin	Pin name	Type	Function
1	GND	-	Return ground for sensors supply
2	+5V Out	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)
3	GND	-	Return ground for sensors supply
4	FDBK	I	Analogue input, 12-bit, 0-5V. Used to read an analogue position or speed feedback (as tacho), or used as general purpose analogue input;
5	A2-/Pulse-/ Data-/SL-	I	Incr. encoder2 A- diff. input, or Pulse-, or Data- for SSI, or Slave- for BiSS; has 150 $\Omega$ resistor between pins 5 and 6
6	A2+/Pulse+/ Data+/SL+	I	Incr. encoder2 A+ diff. input, or Pulse+, or Data+ for SSI, or Slave+ for BiSS; has 150 $\Omega$ resistor between pins 5 and 6
7	B2-/Dir-/CLK-/MA-	I/O	Incr. encoder2 B- diff. input, or Dir-, or Clock- for SSI, or Master- for BiSS; has 150 $\Omega$ resistor between pins 7 and 8
8	B2+/Dir+/CLK+/MA+	I/O	Incr. encoder2 B+ diff. input, or Dir+, or Clock+ for SSI, or Master+ for BiSS; has 150 $\Omega$ resistor between pins 7 and 8
9	Z2-	I	Incr. encoder2 Z- diff. input; has 150 $\Omega$ resistor between pins 9 and 10
10	Z2+	I	Incr. encoder2 Z+ diff. input ; has 150 $\Omega$ resistor between pins 9 and 10

**Remark:** Feedback#2 signals are also available at J16.

### 3.3.14 J18 – Feedback #1 connector (DB15)

Pin	Pin name	Type	Function
1	+5V Out	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)
2	Hall 1	I	Digital input Hall 1 sensor
3	Hall 2	I	Digital input Hall 2 sensor
4	B1+/Cos+	I	Incr. encoder1 B single-ended, or B+ diff. input, or analogue encoder Cos+ diff. input
5	A1+/Sin+	I	Incr. encoder1 A single-ended, or A+ diff. input, or analogue encoder Sin+ diff. input
6	n.c.		
7	GND	-	Return ground for sensors supply
8	GND	-	Return ground for sensors supply
9	Z1+	I	Incr. encoder1 Z single-ended, or Z+ diff. input
10	Z1-/ LH3	I	Incr. encoder1 Z- diff. input, or Linear Hall 3 analogue input
11	GND	-	Return ground for sensors supply
12	Temp Mot	I	NTC/PTC input. Used to read an analog temperature value
13	Hall 3	I	Digital input Hall 3 sensor
14	B1-/Cos-/LH2	I	Incr. encoder1 B- diff. input, or analogue encoder Cos- diff. input, or Linear Hall 2 analogue input
15	A1- /Sin-/ LH1	I	Incr. encoder1 A- diff. input, or analog encoder Sin- diff. input, or Linear Hall 1 analogue input

**Remark:** Feedback#1 signals are also available at J19 and J6.

### 3.3.15 J19 – Feedback #1 connector (2x5 pin)

Pin	Pin name	Type	Function
1	GND	-	Return ground for sensors supply
2	+5V Out	O	+5V <sub>OUT</sub> output supply (generated by iPOS drive)
3	GND	-	Return ground for sensors supply
4	Temp Mot	I	NTC/PTC input. Used to read an analog temperature value
5	A1- /Sin-/ LH1	I	Incr. encoder1 A- diff. input, or analog encoder Sin- diff. input, or Linear Hall 1 analogue input
6	A1+/Sin+	I	Incr. encoder1 A single-ended, or A+ diff. input, or analogue encoder Sin+ diff. input
7	B1-/Cos-/LH2	I	Incr. encoder1 B- diff. input, or analogue encoder Cos- diff. input, or Linear Hall 2 analogue input
8	B1+/Cos+	I	Incr. encoder1 B single-ended, or B+ diff. input, or analogue encoder Cos+ diff. input
9	Z1-/ LH3	I	Incr. encoder1 Z- diff. input, or Linear Hall 3 analogue input
10	Z1+	I	Incr. encoder1 Z single-ended, or Z+ diff. input

**Remark:** Feedback#1 signals are also available at J18 and J6.

### 3.3.16 J20 – Power supply and motor connector

Pin	Pin name	Type	Function
1	GND	-	Ground for logic supply; internally connected to all GND pins
2	+V <sub>LOG</sub>	I	Logic supply input: +9 to +36V <sub>DC</sub> ; Internally connected to all + V <sub>LOG</sub> pins
3	+V <sub>MOT</sub>	I	Positive terminal of the motor supply +V <sub>MOT</sub> : +11 to +50V <sub>DC</sub>
4	GND	-	Ground for motor supply; internally connected to all GND pins
5	A	O	Phase A for 3-phase motors Phase A+ for 2-phase steppers Motor+ for DC brushed motors
6	B	O	Phase B for 3-phase motors Phase A- for 2-phase steppers Motor- for DC brushed motors
7	C	O	Phase C for 3-phase motors Phase B+ for 2-phase steppers
8	D	O	External brake resistor Phase B- for 2-phase steppers

### 3.3.17 J21 and J22 – EtherCAT connectors

J21 and J22 are standard RJ45 Ethernet connectors, compatible with IEEE802.3 100BASE-T (100Mbit/s). Accept STP/UTP wiring.

J22 – EtherCAT IN connector

J21 – EtherCAT OUT connector

### 3.3.18 J23 – USB connector

J23 is a standard USB B connector, used for communication between the iPOS and PC.

An USB A - B cable type is required.

### 3.3.19 J24 – RS232 connector

Pin	Pin name	Type	Function
1	TX232	O	RS-232 Data Transmission
2	GND	-	Ground
3	RX232	I	RS-232 Data Reception



**CAUTION!**

**WHILE USING CONNECTOR J24, THE J23 USB CONNECTOR MUST REMAIN UNCONNECTED.**



### 3.3.20 SS1 – Sliding Switch 1 – Axis ID selection

Pin	Pin name	Type	Function
1	ID-Bit0	-	Hardware AxisID selection switches They represent the first 7 bits of an 8 bit Axis ID number. If all bits are 0, the Axis ID will be 255.
2	ID-Bit1	-	
3	ID-Bit2	-	
4	ID-Bit3	-	
5	ID-Bit4	-	
6	ID-Bit5	-	
7	ID-Bit6	-	
8	CANopen	-	ON (down): CANopen communication protocol OFF(up): TMLCAN communication protocol No function when using an EtherCAT (-CAT) drive

### 3.3.21 SS2 – Sliding Switch 2 – STO bypass

Pin	Pin name	Type	Function
1	STO2- bypass	-	Connects the STO2- input to GND
2	STO2+ bypass	-	Connects the STO2+ input to +Vlog
3	STO1+ bypass	-	Connects the STO1+ input to +Vlog
4	STO1- bypass	-	Connects the STO1- input to GND

Remark: the functions of the switch are available only if the drive has STO inputs

## 3.4 Mating connectors

Connector	Description	Manufacturer	Part Number
J6	10 socket pluggable terminal connector	Wago	733-110
J16, J18	generic 15-pin High Density D-Sub male	-	-
J17, J19	2x5 pin wire to board connector	Harting	0918-510-6803
J20	8 socket pluggable terminal connector	Wago	734-108
J21, J22	Standard 8P8C modular jack (RJ-45) male	-	-
J23	Standard USB B type connector	-	-

## 3.5 Jumper settings

0 = Jumper OFF; 1 = Jumper ON; 1-2 – pin 1 and 2 connected; 2-3 – pin 2 and 3 connected

Jumper Name	Jumper Function	Option	Result
JP1	Factory setup	0	Normal operation
		1	Factory setup <sup>1</sup>
JP2	CAN supply	0	Do not connect CAN Supply to +V <sub>LOG</sub>
		1	Connect CAN Supply to +V <sub>LOG</sub>
JP3	CAN termination	0	Do not connect a CAN terminator
		1	Connect a CAN terminator (120Ω resistor)
JP4	Fdbk#2 CLK+ position	1-2	Connect B2+/CLK+ input to J16 pin4
		2-3	Connect B2+/CLK+ input to J16 pin7 and J17 pin 7 will be disconnected
JP5	Fdbk#2 CLK- position	1-2	Connect B2-/CLK- input to J16 pin14

<sup>1</sup> Always leave open this jumper for normal operation

		2-3	Connect B2-/CLK- input to J16 pin8 and J17 pin 8 will be disconnected	
JP6	Fdbk#2 DAT+ position	1-2	Connect A2+/DAT+ input to J16 pin5	
		2-3	Connect A2+/DAT+ input to J16 pin2 and J17 pin 5 will be disconnected	
JP7	Fdbk#2 DAT- position	1-2	Connect A2-/DAT- input to J16 pin15	
		2-3	Connect A2-/DAT- input to J16 pin3 and J17 pin 6 will be disconnected	
JP8	Ref. 5/10	OFF	Do not connect when JP9=2-3	
		1-2	Select 0...+5 V analogue Reference	
		2-3	Select -10...+10 V analogue Reference	
JP9	VR1 selection	OFF	Select External analogue Reference or. Feedback. VR1 is not connected to either signal.	
		1-2	Select Internal anlg Feedback; use VR1 on analogue Feedback; JP10 must be OFF	
		2-3	Select Internal anlg Reference; use VR1 on analogue Reference; JP8 must be OFF	
JP10	Fdbk. 5/10	OFF	Do not connect when JP9=1-2	
		1-2	Select 0...+5 V analogue Feedback	
		2-3	Select -10...+10 V analogue Feedback	
JP11	AutoRun	0	Enable AutoRun (normal operation with TMLCAN)	
		1	Disable AutoRun (if TMLCAN); Disable Setup (if EtherCAT)	
JP12	LH3 source	1-2	Connect <u>J18 pin 10</u> and <u>J19 pin 9</u> to Z1- (on iPOS)	
		2-3	Connect <u>J18 pin 10</u> and <u>J19 pin 9</u> to LH3 (on iPOS)	
JP13	LH1 source	1-2	Connect <u>J18 pin 15</u> and <u>J19 pin 5</u> to A1-/Sin- (on iPOS)	
		2-3	Connect <u>J18 pin 15</u> and <u>J19 pin 5</u> to LH1 (on iPOS)	
JP14	LH2 source	1-2	Connect <u>J18 pin 14</u> and <u>J19 pin 7</u> to B1-/Cos- (on iPOS)	
		2-3	Connect <u>J18 pin 14</u> and <u>J19 pin 7</u> to LH2- (on iPOS)	
JP15	Enc Z1 termination	0	Do not connect a 150Ω resistor between Z1+ and Z1-	
		1	Connect a 150Ω resistor between Z1+ and Z1-	
JP16	Enc B1/Cos termination	0	Do not connect a 150Ω resistor between B1+/Cos+ and B1-/Cos-	
		1	Connect a 150Ω resistor between B1+/Cos+ and B1-/Cos-	
JP17	Enc A1/Sin termination	0	Do not connect a 150Ω resistor between A1+/Sin+ and A1-/Sin-	
		1	Connect a 150Ω resistor between A1+/Sin+ and A1-/Sin-	
JP18	Inputs PNP/NPN selection	1-2	Inputs are PNP type; connect to +Vlog for state change	The inputs type must also be selected by software, in Setup
		2-3	Inputs are NPN type; connect to GND for state change	
JP19	KTY83 sensor for Temp Mot input	1-2	1mA reference current when using the KTY83 temperature sensor on Temp Mot (J18 pin12 or J19 pin 4)	
		2-3	no function	

### 3.6 Default jumper settings

By default the I/O board is delivered with the jumpers in the following positions:

- a. 1, 8, 11, 15, 16, 17, 19, 20 = OFF
- b. 2, 3 = ON
- c. 4, 5, 6, 7, 10, 12, 13, 14, 18 = pos 1-2
- d. 9 = pos 2-3

The default SS1 settings select the TMLCAN protocol with the axisID is 255 (all switches are 0). In order to quickly change to CANopen protocol, set switch 8 and 1 from SS1 = 1. The CANopen axisID set will be 1 (because of switch 1=1).

SS2 (STO bypass settings) has all switches set to OFF.

### 3.7 Axis ID and CAN Protocol selection for CAN drives

The AxisID can be selected by using the sliding switches 1 to 7 on SS1.

Example:

Switch7 ID 6	Switch6 ID 5	Switch5 ID 4	Switch4 ID 3	Switch3 ID 2	Switch2 ID 1	Switch1 ID 0	8bit binary	Resulting AxisID (dec)
0	0	0	0	0	0	0	00000000	255
0	0	0	0	0	0	1	00000001	1
0	0	0	0	1	0	1	00000101	5
1	0	1	1	1	0	1	01011101	93
1	1	1	1	1	1	1	01111111	127

The CAN protocol selection is done via switch 8 of SS1:

- CANopen mode, if the switch is ON
- TMLCAN mode, if the switch is OFF

**Remark:** In CANopen mode, if the AxisID is set to 255, the drive remains “non-configured” waiting for a CANopen master to configure it using CiA-305 protocol. A “non-configured” drive answers only to CiA-305 commands. All other CANopen commands are ignored and transmission of all other messages (including boot-up) is disabled. The green Ready LED will blink at 1s intervals until the axisID is different than 255.

### 3.8 Axis ID Selection for iPOS4808 MY-CAT-STO drives with EtherCAT

The iPOS4808 MY-CAT-STO drives support all EtherCAT standard addressing modes. In case of device addressing mode based on node address, the iPOS4808 MY-CAT drive sets at bootup the *configured station alias* address with its AxisID value. The drive AxisID value is set after power on in one of the following ways:

- a) By hardware, function SS1 position. The AxisID value is computed in the same way as in the case of the CAN drives.

**Remark:** switch 8 on SS1 has no function if the drive is EtherCAT compatible.

- b) By software, setting via EasySetUp a specific AxisID value in the range 1-255.

**Remark:** some EtherCAT masters do not work with drives having the *configured station alias* set as 255.

## 3.9 Installing and configuring the USB drivers

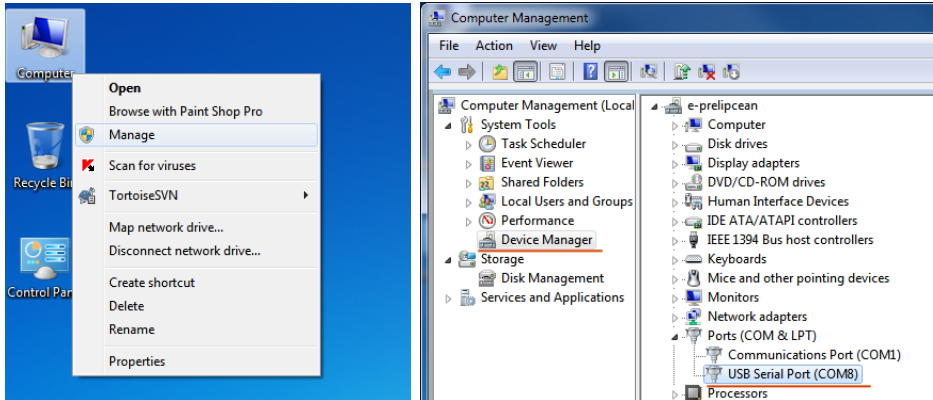
### 3.9.1 Installing the USB drivers

Windows 7 and newer should find the drives automatically. In case your current version of Windows does not automatically detect the USB drivers, download the latest version from here <http://www.ftdichip.com/Drivers/VCP.htm>.

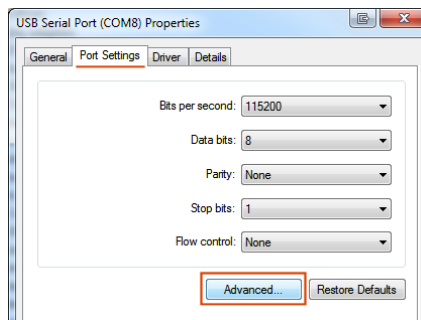
### 3.9.2 USB driver configuration

The FDTI drives are set by default with a latency of 16ms instead of 1. This leads to low communication rates. To decrease this latency, follow the steps below to configure the USB driver:

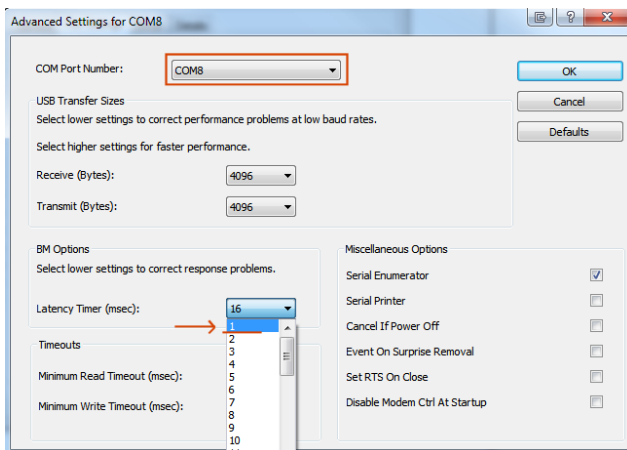
1. Open Computer Management tool and select Device Manager. Expand Ports (COM & LPT) and double click on the USB Serial Port (COMx).



2. Click the Port Settings tab and then the Advanced button.



3. Set the Latency Time (ms) to 1 instead of the default value. This will ensure optimal communication with the drive.



**Remark:** The COM port number can be also changed from Advanced Settings dialog

4. Press OK button to complete the configuration of the COM port.

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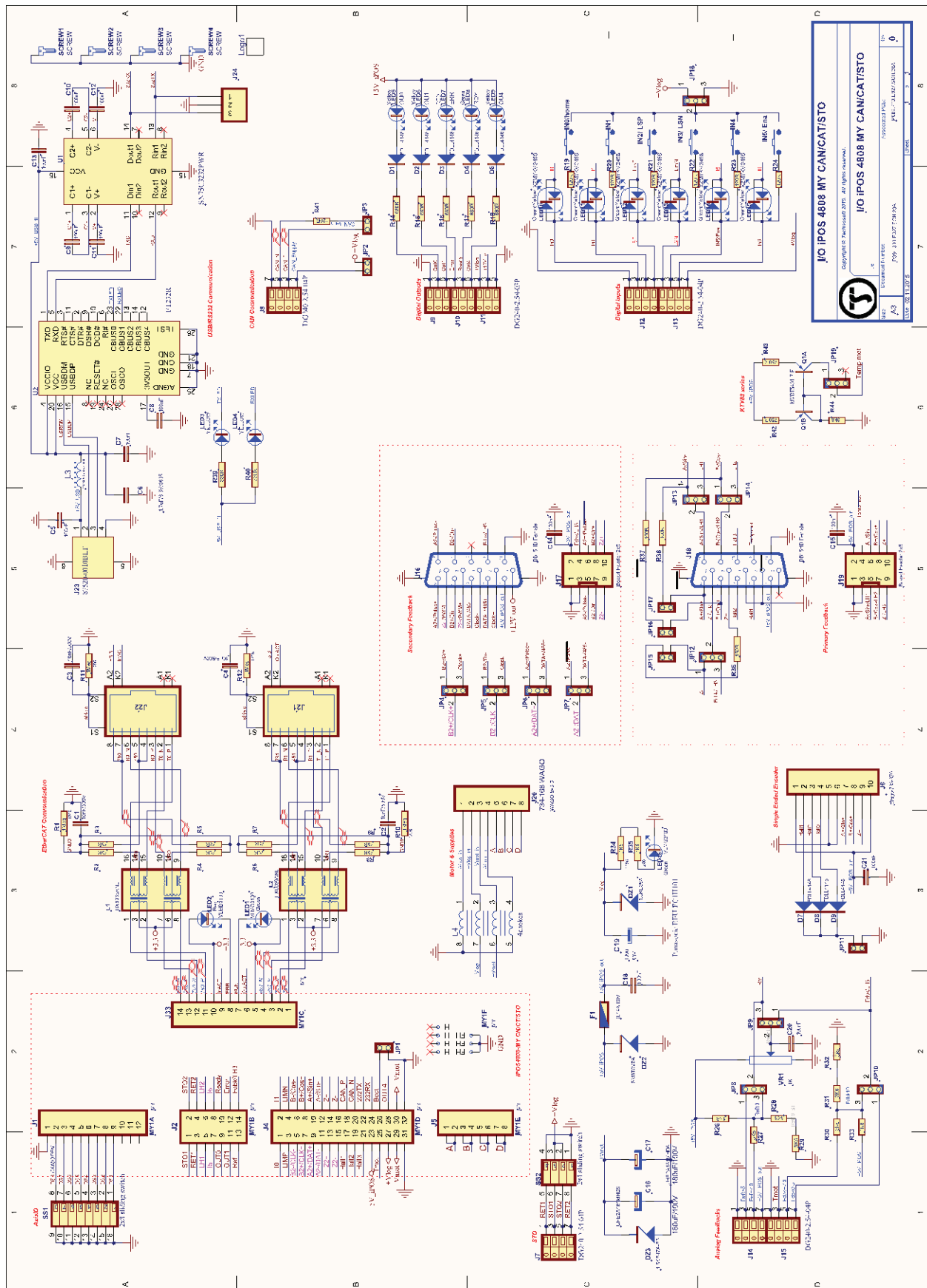
### 3.10 First Power Up

In order to setup the drive for your application you need to communicate with it. The easiest way is via an USB link between your PC and the drive.

Before the first power up, check the following:

2. **iPOS4808** mounting: it shall be fully inserted in the **IO-iPOS4808** board. J1 of drive to J1 of IO, J2 to J2, etc.
3. Motor connections
4. USB cable connections
5. **IO-iPOS4808MY** board jumpers settings.
6. The default SS1 settings select the TMLCAN protocol with the axisID is 255 (all switches are 0). In order to quickly change to CANopen protocol, set switch 8 and 1 from SS1 = 1. The CANopen axisID set will be 1 (because of switch 1=1).
7. Power on the **IO-iPOS4808MY** board, the **OUT2/ Ready** LED and the +Vlog LED should light up as green.

# Appendix 1: IO-iPOS4808MY schematics



## Appendix 2: iPOS4808 MY Plug-in Connector Pin-out

	Pin	Name	Type	Description
J1	1	GND	-	Return ground for all signals. Internally connected to J4 pins 31 and 32, to metallic cover, and to the 3 fixing screws
	2	TMLCAN / CANopen	I	Connect to GND to enable CANopen protocol Leave disconnected for TMLCAN protocol
	3	Axis ID Bit6	I	8 bit H/W Axis ID register. Connect pin to GND to set bit to 1. Up to 127 H/W axis ID combinations.
	4	Axis ID Bit5	I	
	5	Axis ID Bit4	I	
	6	Axis ID Bit3	I	
	7	Axis ID Bit2	I	
	8	Axis ID Bit1	I	
	9	Axis ID Bit0	I	
	10	reserved	-	Reserved for interface extensions†
	11	reserved	-	Reserved for interface extensions†
	12	reserved	-	Reserved for interface extensions†
	Pin	Name	Type	Description
J33	1	RX1-	I/O	Receive/Transmit negative, OUT port. Connect to magnetics PHY RX1.
	2	RX1+	I/O	Receive/Transmit positive, OUT port. Connect to magnetics PHY RX1.
	3	TX1-	I/O	Transmit/Receive negative, OUT port. Connect to magnetics PHY TX1.
	4	TX1+	I/O	Transmit/Receive positive, OUT port. Connect to magnetics PHY TX1.
	5	3.3V	O	Return for center tap of magnetics PHY TX1 and RX1. Internally connected to J33 pin 10.
	6	ACT1	O	Anode of Link/Activity LED for port OUT.
	7	RUN	O	Anode of Run LED (EtherCAT status machine).
	8	ERR	O	Anode of Error LED (EtherCAT status machine).
	9	ACT0	O	Anode of Link/Activity LED for port IN.
	10	3.3V	O	Return for center tap of magnetics PHY TX0 and RX0. Internally connected to J33 pin 5.
	11	TX0+	I/O	Transmit/Receive positive, IN port. Connect to magnetics PHY TX0.
	12	TX0-	I/O	Transmit/Receive negative, IN port. Connect to magnetics PHY TX0.
	13	RX0+	I/O	Receive/Transmit positive, IN port. Connect to magnetics PHY RX0.
	14	RX0-	I/O	Receive/Transmit negative, IN port. Connect to magnetics PHY RX0.
	Pin	Name	Type	Description
J5	1,2	A/A+	O	Phase A for 3-ph motors, A+ for 2-ph steppers, Motor+ for DC brush motors
	3,4	B/A-	O	Phase B for 3-ph motors, A- for 2-ph steppers, Motor- for DC brush motors
	5,6	C/B+	O	Phase C for 3-ph motors, B+ for 2-ph steppers
	7,8	Br/B-	O	Brake resistor / Phase B- for 2-ph steppers
	Pin	Name	Type	Description
J2*	1*	STO1+	I	Safe Torque Off input 1, positive input (opto-isolated, 18÷40V)
	2*	STO2+	I	Safe Torque Off input 2, positive input (opto-isolated, 18÷40V)
	3*	STO1-	I	Safe Torque Off input 1, negative return (opto-isolated, 0V)
	4*	STO2-	I	Safe Torque Off input 2, negative return (opto-isolated, 0V)
	5	LH1	I	Linear Hall 1 input
	6	LH2	I	Linear Hall 2 input
	7	IN4	I	5-36V general-purpose digital PNP/NPN input
	8	IN5	I	5-36V general-purpose digital PNP/NPN input
	9	OUT0	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
	10	OUT3/Ready	O	5-36V 0.5A, drive Ready output, active low, NPN open-collector/TTL pull-up. Also drives the green LED.
	11	OUT1	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
	12	OUT2/Error	O	5-36V 0.5A, drive Error output, active low, NPN open-collector/TTL pull-up. Also drives the red LED
	13	REF	I	Analogue input, 12-bit, 0-5V. Used to read an analog position, speed or torque reference, or used as general purpose analogue input
	14	FDBK / LH3	I	Analogue input, 12-bit, 0-5V. Used to read an analogue position or speed feedback (as tacho), or used as general purpose analogue input / or Linear Hall 3 input

**\*Remark:** On drives without –STO in their name, J2 pins 1,2,3,4 are missing

Pin	Name	Type	Description
1	IN0	I	5-36V general-purpose digital PNP/NPN input
2	IN1	I	5-36V general-purpose digital PNP/NPN input
3	IN2/LSP	I	5-36V digital PNP/NPN input. Positive limit switch input
4	IN3/LSN	I	5-36V digital PNP/NPN input. Negative limit switch input
5	B2-/Dir-/CLK-/MA-	I/O	Incr. encoder2 B- diff. input, or Dir- , or Clock- for SSI, or Master- for BiSS; has 150Ω resistor between pins 5 and 7
6	B1-/Cos-	I	Incr. encoder1 B- diff. input, or analogue encoder Cos- diff. input
7	B2+/Dir+/CLK+/MA+	I/O	Incr. encoder2 B+ diff. input, or Dir+ , or Clock+ for SSI, or Master+ for BiSS; has 150Ω resistor between pins 5 and 7
8	B1+/Cos+	I	Incr. encoder1 B single-ended, or B+ diff. input, or analogue encoder Cos+ diff. input
9	A2+/Pulse+/Data+/SL+	I	Incr. encoder2 A+ diff. input, or Pulse+ , or Data+ for SSI, or Slave+ for BiSS; has 150Ω resistor between pins 9 and 11
10	A1+/Sin+	I	Incr. encoder1 A single-ended, or A+ diff. input, or analogue encoder Sin+ diff. input
11	A2-/Pulse-/Data-/SL-	I	Incr. encoder2 A- diff. input, or Pulse- , or Data- for SSI, or Slave- for BiSS; has 150Ω resistor between pins 9 and 11
12	A1-/Sin-	I	Incr. encoder1 A- diff. input, or analogue encoder Sin- diff. input
13	Z2+	I	Incr. encoder2 Z+ diff. input ; has 150Ω resistor between pins 13 and 15
14	Z1+	I	Incr. encoder1 Z single-ended, or Z+ diff. input,
15	Z2-	I	Incr. encoder2 Z- diff. input; has 150Ω resistor between pins 13 and 15
16	Z1-	I	Incr. encoder1 Z- diff. input
17	Hall 1	I	Digital input Hall 1 sensor
18	CAN Hi	I/O	CAN-Bus positive line(dominant high)
19	Hall 2	I	Digital input Hall 2 sensor
20	CAN Lo	I/O	CAN-Bus negative line (dominant low)
21	Hall 3	I	Digital input Hall 3 sensor
22	232TX	O	RS-232 Data Transmission
23	+5V <sub>OUT</sub>	O	5V output supply for I/O usage
24	232RX	I	RS-232 Data Reception
25	Temp Mot	I	NTC/PTC input. Used to read an analog temperature value
26	Reserved	-	Reserved. Do not connect.
27	+V <sub>LOG</sub>	I	Positive terminal of the logic supply input: 9 to 36V <sub>DC</sub>
28	OUT4	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
29	+V <sub>MOT</sub>	I	Positive terminal of the motor supply: 11 to 48V <sub>DC</sub> .
30	+V <sub>MOT</sub>	I	Positive terminal of the motor supply: 11 to 48V <sub>DC</sub> .
31	GND	-	Return ground for all signals. Internally connected to J4 pin 32, to J1 pin 1, to metallic cover, and to the 3 fixing screws
32	GND	-	





T E C H N O S O F T