IO iPOS4808

v1.0B

I/O Board for iPOS4808 Intelligent Servo Drives

TECHNOSOFT

Intelligent Drives

Technical Reference

TECHNOSOFT

IO-iPOS4808

Technical Reference

P091.084.IO-iPOS4808.UM.0113

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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 VX-CAN/CAT** extension boards **version 1.0B** that are included in the **iPOS4808** intelligent servo drives starter kits.

The **IO iPOS360x** extension board can be one of the following products:

iPOS480x VX-CAN IO	p/n P027.014.E880	For drives with CAN.
iPOS480x VX-CAT IO	p/n P027.014.E890	For drives with EtherCAT.

Paragraph 2.4 shows how to quickly identity the IO-iPOS4808 version. If your IO-iPOS4808 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 VX-CAN or VX-CAT drive that can be connected to this I/O extension

TML – Technosoft Motion Language

Related Documentation

iPOS4808 VX Technical Reference (part no. P091.027.iPOS4808.VX.UM.xxxx) – describes the hardware installation of the iPOS4808 VX family of intelligent servo drives including the technical data, the connectors and the wiring diagrams needed for installation and an overview of the setup steps and motion programming options

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 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

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Contents

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***

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.

2. Product Overview

2.1. Introduction

The **IO-iPOS4808** I/O extension board is an auxiliary module allowing rapid evaluation of the **iPOS4808 VX-CAN** or **iPOS4808 VX-CAT** Intelligent Servo Drives.

On the IO-iPOS4808, the iPOS4808 drives are connected directly to J1 connector. The EtherCAT extension module allows EtherCAT communication through connectors J2 and J3 if the product ID of the board is iPOS4808 VX-CAT IO.

The IO-iPOS4808 offers the user an easy and direct access to the main signals available on the iPOS4808 connector like: USB and CAN communication, motor and feedback connections, digital I/Os and analogue inputs. The IO-iPOS4808 can be used in many ways starting from basic evaluation purposes up to complete implementation of motion control applications.

2.2. Key Features

- Motor supply: +11…. +50 V_{DC}
- Logic supply: +9…. +36 V_{DC}
- Direct access to the following iPOS4808 I/O signals, via screw-terminals connectors:
  - 8 digital inputs, 5-36V (compatible with NPN outputs):
    - 5 general – purpose inputs: IN0, IN1, IN5, IN6 and IN7
    - 2 limit switch inputs: IN2/LSP (positive) and IN3/LSN (negative)
    - One Enable input: IN4/Enable
  - 5 digital outputs, 5-36V, 0.5A (NPN open-collector/TTL pull-up):
    - 3 general-purpose outputs: OUT0, OUT1, OUT5
    - One Error output: OUT2/Error
    - One Ready output: OUT3/Ready
  - 2 analog inputs, 0-5V,12-bit used to read:
    - One analogue Reference: REF
    - One analogue Feedback sensor: FBDK
    - 2 general-purpose analogue inputs
- Emulation of external inputs commutation via 8 push-buttons: connected to inputs: IN0, IN1, IN5, IN6, IN7, IN2/LSP, IN3/LSN, IN4/Enable
- Emulation of external analogue reference command via potentiometer VR1
- USB A connector for communication with the PC

- Two RJ10 connectors for CAN communication
- Two RJ 45 for EtherCAT communication[1]
- 2x5 pin motor feedback connector accepting
    - Single-ended or RS-422 differential incremental digital encoder
    - 1Vpp differential Sine/cosine incremental encoder
    - Linear Hall sensors
- HDB15 motor feedback connector

[1] Available only on the iPOS4808 VX-CAT IO board. Usable only when the EtherCAT extension module is present.

2.3. IO-iPOS4808 Board Dimensions

Figure 2.3.1 presents the IO-iPOS4808 board dimensions.

All dimensions are in mm.

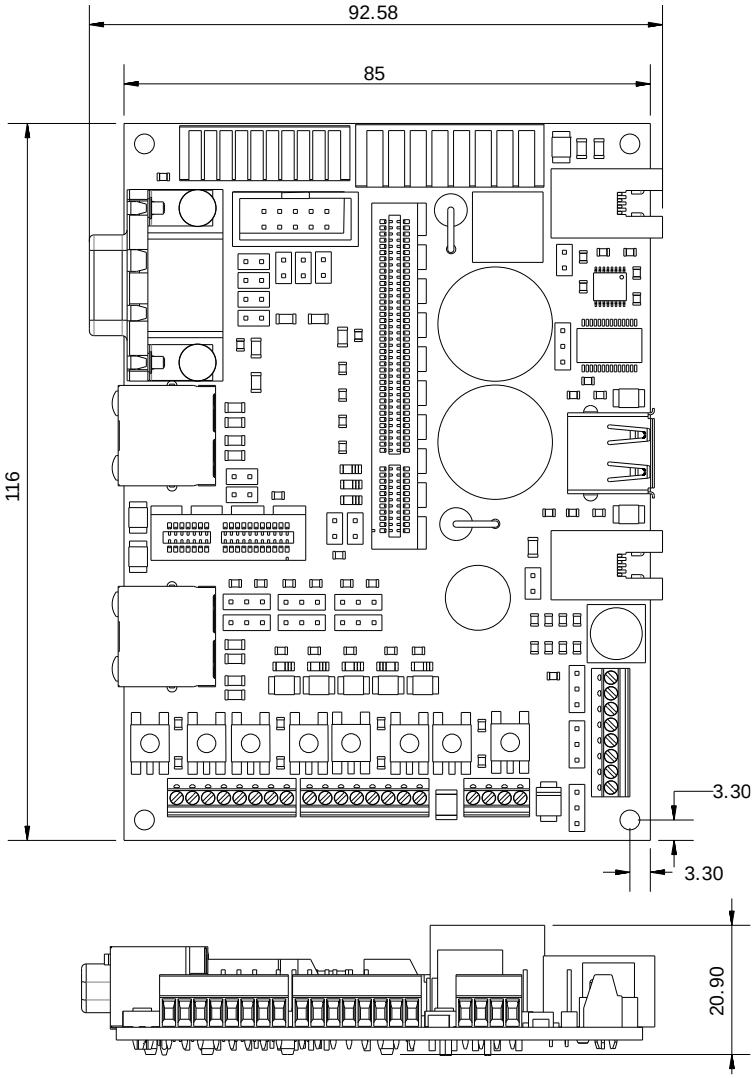


Figure 2.3.1. *IO-iPOS4808 board dimensions*

2.4. IO-iPOS4808 Board Version Identification

Figure 2.4.1 shows how to identify the IO-iPOS4808 board version on its back side.

This manual refers to IO-iPOS4808 **version 1.0B**. If your IO-iPOS4808 version differs, you can find the appropriate manual on the Technosoft web page.

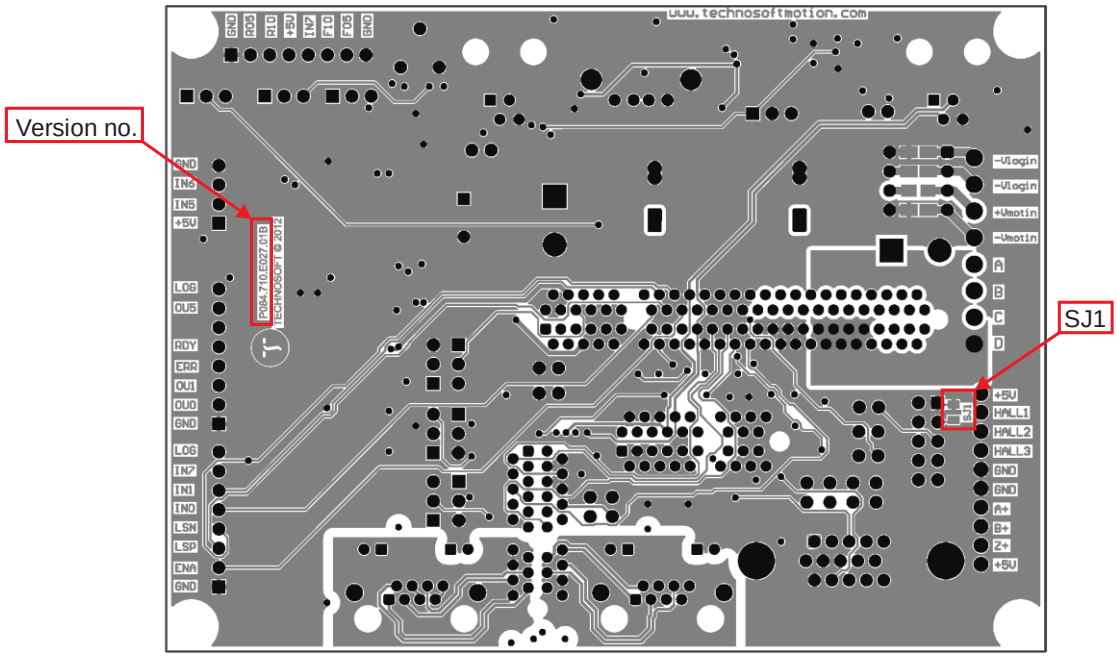


Figure 2.4.1. *IO-iPOS4808 V1.0B board version identification*

This manual refers to IO-iPOS4808 **version 1.0B**. If your IO-iPOS4808 version differs, please refer to the appropriate IO-iPOS4808 Technical Reference Manual, that can be freely downloaded from Technosoft web page.

Remark:

The iPOS4808 VX-CAN IO (p/n: 027.014.E880) does not have EtherCAT connectors.

3. Hardware Installation

3.1. Mounting

Press the iPOS4808 VX drive into IO-iPOS4808 board J1 connector.

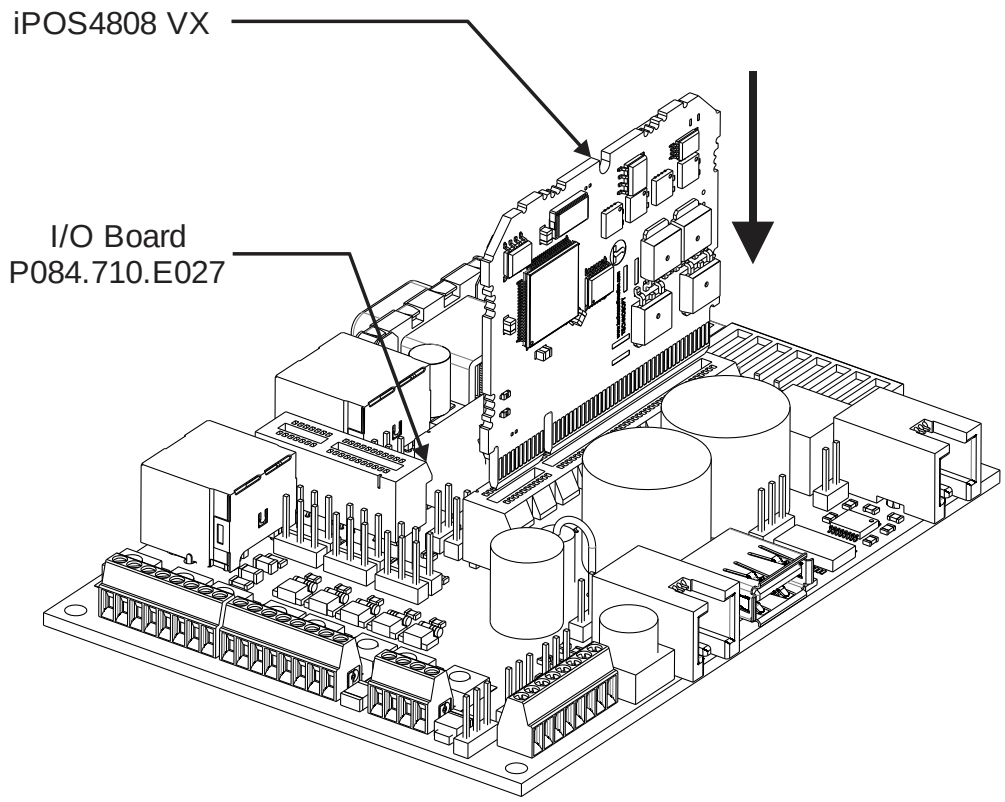


Figure 3.1.1 *Installing an iPOS4808 VX drive in the IO-iPOS4808*

Insert the EtherCAT VX interface into J5 board connector.

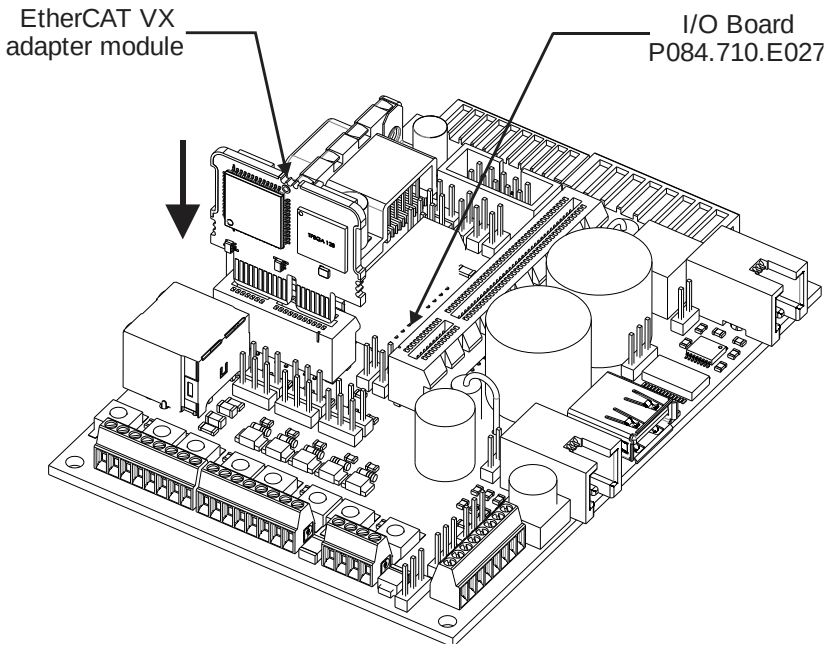


Figure 3.1.2 *Installing an EtherCAT interface module in the IO-iPOS4808*

3.2. Connectors

3.2.1. Connectors Layout

The Figure **3.2.1.** shows the top view of the **IO-iPOS4808** Extension Board.

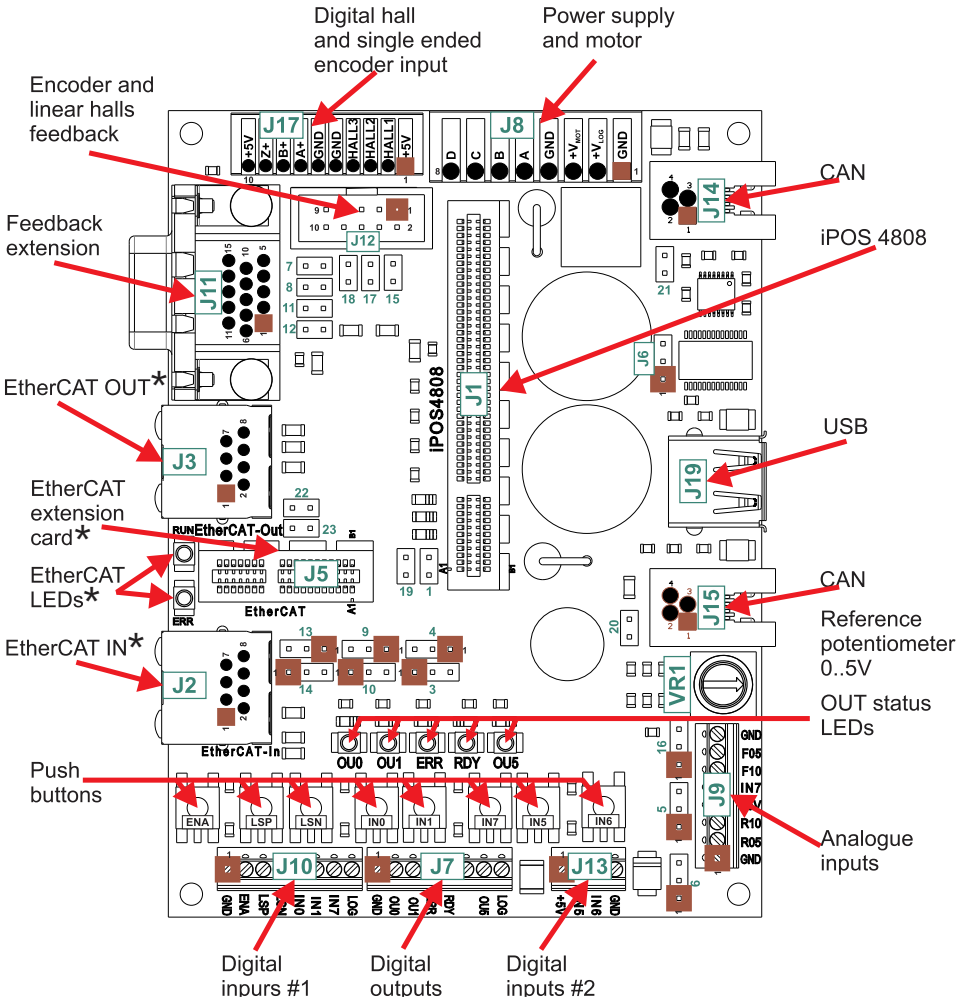


Figure 3.2.1. Top view of the IO-iPOS4808 extension board

**The EtherCAT connectors are present only on the iPOS4808 VX-CAT IO board.*

CAUTION! ***BEFORE CONNECTING / DISCONNECTING ANY OF THE SIGNALS TURN OFF ALL POWER SUPPLIES!***

3.2.2. J2 and J3 – EtherCAT connectors[1]

J2 and J3 are standard RJ45 Ethernet connectors, compatible with IEEE802.3 100BASE-T (100Mbit/s). Accept STP/UTP wiring.

J2 – EtherCAT IN connector

J3 – EtherCAT OUT connector

3.2.3. J6 – 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 J6, THE J19 USB CONNECTOR MUST REMAIN UNCONNECTED.***

3.2.4. J7 – 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
4	ERR	O	Drive error digital output OUT2/Error
5	Ready	O	Drive ready digital output OUT3/Ready
6	-	-	Do not connect. Not available with iPOS4808
7	OUT5	O	General-purpose/ digital output OUT5
8	$+V_{LOG}$		Logic supply: +9 to $+36V_{DC}$

[1] The EtherCAT connectors are available only on the iPOS4808 VX-CAT (p/n P027.014.E890) board

3.2.5. J8 – Power supply and motor connector

Pin	Pin name	Type	Function
1	GND	-	Ground for logic supply
2	$+V_{LOG}$	I	Logic supply: +9 to $+36V_{DC}$
3	$+V_{MOT}$	I	Positive terminal of the motor supply $+V_{MOT}$: +11 to $+50V_{DC}$
4	GND	-	Ground for motor supply
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

3.2.6. J9 – Analog inputs connector

Pin	Pin name	Type	Function
1	GND	-	Ground
2	R05	I	External reference signal (mono-polar 0 to +5V)
3	R10	I	External reference signal (bipolar -10V to +10V)
4	+5V	O	$+5V_{OUT}$ output supply (generated by iPOS4808 drive)
5	IN7	I	General-purpose digital input IN7
6	F10	I	External feedback signal (bipolar -10V to +10V)
7	F05	I	External feedback signal (mono-polar 0 to +5V)
8	GND	-	Ground

3.2.7. J10 – Digital inputs connector #1

Pin	Pin name	Type	Function
1	GND	-	Ground
2	ENA	I	Drive enable digital input IN4/Enable
3	LSP	I	Positive limit switch digital input IN2/LSP
4	LSN	I	Negative limit switch digital input IN3/LSN
5	IN0	I	General-purpose digital input IN0
6	IN1	I	General-purpose digital input IN1
7	In7	I	General-purpose digital input IN7
8	$+V_{LOG}$		Logic supply: +9 to $+36V_{DC}$

3.2.8. J12 – Linear Halls, single-ended and differential encoder connector

Pin	Pin name	Type	Function
1	GND	-	Ground
2	$+5V_{OUT}$	O	$+5V_{OUT}$ output supply (generated by iPOS4808 drive)
3	GND	-	Ground for AvagoTech Option (solder SJ1)
4	$+5V_{OUT}$	O	$+5V_{OUT}$ output supply (generated by iPOS4808 drive)
5	A-/Sin-/LH1	I	Incremental encoder A- differential input, or analogue encoder Sin- differential input, or linear Hall 1 input
6	A/A+/Sin+	I	Incremental encoder A single-ended, or A+ differential input, or analogue encoder Sin+ differential input
7	B-/Cos-/LH2	I	Incremental encoder B- differential input, or analogue encoder Cos- differential input, or linear Hall 2 input
8	B/B+/Cos+	I	Incremental encoder B single-ended, or B+ differential input, or analogue encoder Cos+ differential input
9	Z-/LH3	I	Incremental encoder Z- (index) differential input, or linear Hall 3 input
10	Z/Z+	I	Incremental encoder Z (index) single-ended, or Z+ differential input

Remark:

*For direct connection of AvagoTech HEDL encoders, you need to connect pin 3 to **GND** by soldering SJ1 located on the back side of the IO board near the J12 connector.*

3.2.9. J13 – Digital inputs connector #2

Pin	Pin name	Type	Function
1	$+5V_{OUT}$	O	$+5V_{OUT}$ output supply (generated by iPOS4808 drive)
2	IN5	I	General-purpose digital input IN5
3	IN6	I	General-purpose digital input IN6
4	GND	-	Ground

3.2.10. J14 and J15 – CAN connectors

Pin	Pin name	Type	Function
1	CAN_V+	O	If JP21=1, $+V_{LOG}$ 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. *Put JP20 jumper to add a 120Ω terminal resistor in your CAN network. Leave JP20 open if the CAN network already has terminal resistors.*
2. *Put JP21 jumper to connect the IOiPOS4808 logic supply $+V_{LOG}$ to CAN_V+. Leave JP21 open if the CAN network has a separate supply connected to CAN_V+.*

3.2.11. J17 – Digital hall connector

Pin	Pin name	Type	Function
1	+5ViPOS	O	+5V_{OUT} output supply (generated by iPOS4808 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	A/A+/Sin+	I	Incremental encoder A single-ended encoder
8	B/B+/Cos+	I	Incremental encoder B single-ended encoder
9	Z/Z+	I	Incremental encoder Z (index) single-ended
10	+5ViPOS	O	+5V_{OUT} output supply (generated by iPOS4808 drive)

3.2.12. J19 – USB connector

J19 is a standard USB A connector, used for communication between the iPOS and PC.

A USB A - A cable type is required.

3.3. Jumper Settings

Jumper Name	Jumper Function	Option	Result
1	Factory setup	0[1]	Normal operation
		1	Factory setup[2]
3	AxisID0_MSB	1-2	Connect AxisID0 input to +5V_{DC}
		2-3	Connect AxisID0 input to GND
		OFF	Leave input unconnected
4	AxisID0_LSB	1-2	Don’t connect a pull-up/pull-down resistor to

[1] 0 = Jumper OFF, 1 = Jumper ON

[2] Always leave open this jumper for normal operation

			AxisID0
		2-3	Connect a pull-up/pull-down 4.7K Ω resistor (depending on jumper 3) to AxisID0
		OFF	Connect a pull-up/pull-down 22K Ω resistor (depending on jumper 3) to AxisID0
5	Ref. 5/10	1-2	Select 0…+5 V Reference
		2-3	Select -10…+10 V Reference
6	Ref. Int/Ext	1-2	Select Internal Reference
		2-3	Select External Reference
7	Sine+	ON	Sin+ is 1Vpp and goes from J11 to iPOS4808
		OFF	reserved
8	Sine-	ON	Sin- is 1Vpp and goes from J11 to iPOS4808
		OFF	reserved
9	AxisID1_MSB	1-2	Connect AxisID1 input to +5V_{DC}
		2-3	Connect AxisID1 to GND
		OFF	Leave input unconnected
10	AxisID1_LSB	1-2	Don’t connect a pull-up/pull-down resistor to AxisID1
		2-3	Connect a pull-up/pull-down 4.7K Ω resistor (depending on jumper 9) to AxisID1
		OFF	Connect a pull-up/pull-down 22K Ω resistor (depending on jumper 9) to AxisID1
11	Cosine+	ON	Cos+ is 1Vpp and goes from J11 to iPOS4808
		OFF	reserved
12	Cosine-	ON	Cos- is 1Vpp and goes from J11 to iPOS4808
		OFF	reserved
13	AxisID2_MSB	1-2	Connect AxisID2 to +5V_{DC}
		2-3	Connect AxisID2 to GND
		OFF	Leave input unconnected
14	AxisID2_LSB	1-2	Don’t connect a pull-up/pull-down resistor to AxisID2
		2-3	Connect a pull-up/pull-down 4.7K Ω resistor (depending on jumper 13) to AxisID2

		OFF	Connect a pull-up/pull-down 22K Ω resistor (depending on jumper 13) to AxisID2
15	EncA/Sin termination	0	Do not connect a 120Ω resistor between A+/Sin+ and A-/Sin-
		1	Connect a 120Ω resistor between A+/Sin+ and A-/Sin-
16	Fdbk. 5/10	1-2	Select 0…+5 V Feedback
		2-3	Select -10…+10 V Feedback
17	EncB/Cos termination	0	Do not connect a 120Ω resistor between B+/Cos+ and B-/Cos-
		1	Connect a 120Ω resistor between B+/Cos+ and B-/Cos-
18	EncZ termination	0	Do not connect a 120Ω resistor between Z+ and Z-
		1	Connect a 120Ω resistor between Z+ and Z-
19	AutoRun	0	Enable AutoRun (normal operation)
		1	Disable AutoRun
20	CAN termination	0	Do not connect a CAN terminator
		1	Connect a CAN terminator (120Ω resistor)
21	CAN supply	0	Do not connect CAN Supply to $+V_{LOG}$
		1	Connect CAN Supply to $+V_{LOG}$
22	Reserved	-	Do not connect.
23	Reserved	-	Do not connect.

3.4. Axis ID and CAN Protocol selection for iPOS4808 VX-CAN drives

The iPOS4808 VX-CAN drive has 3 analogue inputs named AxisID0, AxisID1 and AxisID2 used to select the CAN protocol: CANopen or Technosoft TMLCAN and the drive address or axis ID. The iPOS4808 VX drive can detect up to 7 different voltage levels on these 3 inputs. On the IO iPOS4808 module the 7 voltage levels can be selected via the jumpers: 3, 4, 9, 10, 13 and 14. Each AxisID input has 2 jumpers associated. A 3-pin jumper (3 / 9 / 13) is used to connect an Axis ID input to GND (position 2-3), $+5V_{DC}$ (position 1-2) or leave it unconnected (OFF). Another 3-pin jumper (4 / 10 / 14) is used to select how to do the connection: directly (position 1-2), via a pull-up / pull-down resistor of 4.7K Ω (position 2-3) or via a 22K resistor when left unconnected (OFF). The 7 levels can be obtained using the following jumper positions:

Table 3.1 *Jumper setting for the seven voltage levels of AxisID0*

Level	Connection needed	Jumper 4	Jumper 3
L0	Connect input directly to ground	1-2	2-3
L1	Connect input through a 4.7KΩ resistor to ground	2-3	2-3
L2	Connected input through a 22KΩ resistor to ground	OFF	2-3
L3	Nothing connected – leave input open	-	OFF
L4	Connect input through a 22KΩ resistor to $+5V_{DC}$	OFF	1-2
L5	Connect input through a 4.7Kohm resistor to $+5V_{DC}$	2-3	1-2
L6	Connect input directly to +5V	1-2	1-2

Table 3.2 *Jumper setting for the seven voltage levels of AxisID1*

Level	Connection needed	Jumper 10	Jumper 9
L0	Connect input directly to ground	1-2	2-3
L1	Connect input through a 4.7KΩ resistor to ground	2-3	2-3
L2	Connected input through a 22KΩ resistor to ground	OFF	2-3
L3	Nothing connected – leave input open	-	OFF
L4	Connect input through a 22KΩ resistor to $+5V_{DC}$	OFF	1-2
L5	Connect input through a 4.7Kohm resistor to $+5V_{DC}$	2-3	1-2
L6	Connect input directly to +5V	1-2	1-2

Table 3.3 *Jumper setting for the seven voltage levels of AxisID2*

Level	Connection needed	Jumper 14	Jumper 13
L0	Connect input directly to ground	1-2	2-3
L1	Connect input through a 4.7KΩ resistor to ground	2-3	2-3
L2	Connected input through a 22KΩ resistor to ground	OFF	2-3
L3	Nothing connected – leave input open	-	OFF
L4	Connect input through a 22KΩ resistor to $+5V_{DC}$	OFF	1-2
L5	Connect input through a 4.7Kohm resistor to $+5V_{DC}$	2-3	1-2
L6	Connect input directly to +5V	1-2	1-2

The CAN protocol selection is done via AxisID2:

- CANopen mode, if the input levels are: L0, L1 or L2
- TMLCAN mode, if the input levels are L3, L4, L5, L6

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.*

Table 3.4. *Axis ID setting in CANopen mode*

Axis ID 2	Axis ID 1	Axis ID 0	ID CANopen
L0	L0	L0	127
L0	L0	L1	1
L0	L0	L2	2
L0	L0	L3	3
L0	L0	L4	4
L0	L0	L5	5
L0	L0	L6	6
L0	L1	L0	7
L0	L1	L1	8
L0	L1	L2	9
L0	L1	L3	10
L0	L1	L4	11
L0	L1	L5	12
L0	L1	L6	13
L0	L2	L0	14
L0	L2	L1	15
L0	L2	L2	16
L0	L2	L3	17
L0	L2	L4	18
L0	L2	L5	19
L0	L2	L6	20
L0	L3	L0	21
L0	L3	L1	22
L0	L3	L2	23
L0	L3	L3	24
L0	L3	L4	25
L0	L3	L5	26
L0	L3	L6	27
L0	L4	L0	28
L0	L4	L1	29
L0	L4	L2	30
L0	L4	L3	31
L0	L4	L4	32
L0	L4	L5	33
L0	L4	L6	34
L0	L5	L0	35
L0	L5	L1	36
L0	L5	L2	37
L0	L5	L3	38
L0	L5	L4	39
L0	L5	L5	40
L0	L5	L6	41
L0	L6	L0	42
L0	L6	L1	43
L0	L6	L2	44
L0	L6	L3	45
L0	L6	L4	46
L0	L6	L5	47
L0	L6	L6	48
L1	L0	L0	49
L1	L0	L1	50
L1	L0	L2	51
L1	L0	L3	52
L1	L0	L4	53
L1	L0	L5	54
L1	L0	L6	55
L1	L1	L0	56
L1	L1	L1	57
L1	L1	L2	58
L1	L1	L3	59
L1	L1	L4	60
L1	L1	L5	61
L1	L1	L6	62
L1	L2	L0	63
L1	L2	L1	64
L1	L2	L2	65
L1	L2	L3	66
L1	L2	L4	67
L1	L2	L5	68
L1	L2	L6	69
L1	L3	L0	70
L1	L3	L1	71

Axis ID 2	Axis ID 1	Axis ID 0	ID CANopen
L1	L3	L2	72
L1	L3	L3	73
L1	L3	L4	74
L1	L3	L5	75
L1	L3	L6	76
L1	L4	L0	77
L1	L4	L1	78
L1	L4	L2	79
L1	L4	L3	80
L1	L4	L4	81
L1	L4	L5	82
L1	L4	L6	83
L1	L5	L0	84
L1	L5	L1	85
L1	L5	L2	86
L1	L5	L3	87
L1	L5	L4	88
L1	L5	L5	89
L1	L5	L6	90
L1	L6	L0	91
L1	L6	L1	92
L1	L6	L2	93
L1	L6	L3	94
L1	L6	L4	95
L1	L6	L5	96
L1	L6	L6	97
L2	L0	L0	98
L2	L0	L1	99
L2	L0	L2	100
L2	L0	L3	101
L2	L0	L4	102
L2	L0	L5	103
L2	L0	L6	104
L2	L1	L0	105
L2	L1	L1	106
L2	L1	L2	107
L2	L1	L3	108
L2	L1	L4	109

Axis ID 2	Axis ID 1	Axis ID 0	ID CANopen
L2	L1	L5	110
L2	L1	L6	111
L2	L2	L0	112
L2	L2	L1	113
L2	L2	L2	114
L2	L2	L3	115
L2	L2	L4	116
L2	L2	L5	117
L2	L2	L6	118
L2	L3	L0	119
L2	L3	L1	120
L2	L3	L2	121
L2	L3	L3	122
L2	L3	L4	123
L2	L3	L5	124
L2	L3	L6	125
L2	L4	L0	126
L2	L4	L1	255
L2	L4	L2	255
L2	L4	L3	255
L2	L4	L4	255
L2	L4	L5	255
L2	L4	L6	255
L2	L5	L0	255
L2	L5	L1	255
L2	L5	L2	255
L2	L5	L3	255
L2	L5	L4	255
L2	L5	L5	255
L2	L5	L6	255
L2	L6	L0	255
L2	L6	L1	255
L2	L6	L2	255
L2	L6	L3	255
L2	L6	L4	255
L2	L6	L5	255
L2	L6	L6	255

***Table 3.5**. Axis ID setting in TMLCAN mode*

Axis ID 2	Axis ID 1	Axis ID 0	ID TMLCAN
L3	L0	L0	255
L3	L0	L1	1
L3	L0	L2	2
L3	L0	L3	3
L3	L0	L4	4
L3	L0	L5	5
L3	L0	L6	6
L3	L1	L0	7
L3	L1	L1	8
L3	L1	L2	9
L3	L1	L3	10
L3	L1	L4	11
L3	L1	L5	12
L3	L1	L6	13
L3	L2	L0	14
L3	L2	L1	15
L3	L2	L2	16
L3	L2	L3	17
L3	L2	L4	18
L3	L2	L5	19
L3	L2	L6	20
L3	L3	L0	21
L3	L3	L1	22
L3	L3	L2	23
L3	L3	L3	24
L3	L3	L4	25
L3	L3	L5	26
L3	L3	L6	27
L3	L4	L0	28
L3	L4	L1	29
L3	L4	L2	30
L3	L4	L3	31
L3	L4	L4	32
L3	L4	L5	33
L3	L4	L6	34
L3	L5	L0	35
L3	L5	L1	36

Axis ID 2	Axis ID 1	Axis ID 0	ID TMLCAN
L3	L5	L2	37
L3	L5	L3	38
L3	L5	L4	39
L3	L5	L5	40
L3	L5	L6	41
L3	L6	L0	42
L3	L6	L1	43
L3	L6	L2	44
L3	L6	L3	45
L3	L6	L4	46
L3	L6	L5	47
L3	L6	L6	48
L4	L0	L0	49
L4	L0	L1	50
L4	L0	L2	51
L4	L0	L3	52
L4	L0	L4	53
L4	L0	L5	54
L4	L0	L6	55
L4	L1	L0	56
L4	L1	L1	57
L4	L1	L2	58
L4	L1	L3	59
L4	L1	L4	60
L4	L1	L5	61
L4	L1	L6	62
L4	L2	L0	63
L4	L2	L1	64
L4	L2	L2	65
L4	L2	L3	66
L4	L2	L4	67
L4	L2	L5	68
L4	L2	L6	69
L4	L3	L0	70
L4	L3	L1	71
L4	L3	L2	72
L4	L3	L3	73

Axis ID 2	Axis ID 1	Axis ID 0	ID TMLCAN
L4	L3	L4	74
L4	L3	L5	75
L4	L3	L6	76
L4	L4	L0	77
L4	L4	L1	78
L4	L4	L2	79
L4	L4	L3	80
L4	L4	L4	81
L4	L4	L5	82
L4	L4	L6	83
L4	L5	L0	84
L4	L5	L1	85
L4	L5	L2	86
L4	L5	L3	87
L4	L5	L4	88
L4	L5	L5	89
L4	L5	L6	90
L4	L6	L0	91
L4	L6	L1	92
L4	L6	L2	93
L4	L6	L3	94
L4	L6	L4	95
L4	L6	L5	96
L4	L6	L6	97
L5	L0	L0	98
L5	L0	L1	99
L5	L0	L2	100
L5	L0	L3	101
L5	L0	L4	102
L5	L0	L5	103
L5	L0	L6	104
L5	L1	L0	105
L5	L1	L1	106
L5	L1	L2	107
L5	L1	L3	108
L5	L1	L4	109
L5	L1	L5	110
L5	L1	L6	111
L5	L2	L0	112

Axis ID 2	Axis ID 1	Axis ID 0	ID TMLCAN
L5	L2	L1	113
L5	L2	L2	114
L5	L2	L3	115
L5	L2	L4	116
L5	L2	L5	117
L5	L2	L6	118
L5	L3	L0	119
L5	L3	L1	120
L5	L3	L2	121
L5	L3	L3	122
L5	L3	L4	123
L5	L3	L5	124
L5	L3	L6	125
L5	L4	L0	126
L5	L4	L1	127
L5	L4	L2	128
L5	L4	L3	129
L5	L4	L4	130
L5	L4	L5	131
L5	L4	L6	132
L5	L5	L0	133
L5	L5	L1	134
L5	L5	L2	135
L5	L5	L3	136
L5	L5	L4	137
L5	L5	L5	138
L5	L5	L6	139
L5	L6	L0	140
L5	L6	L1	141
L5	L6	L2	142
L5	L6	L3	143
L5	L6	L4	144
L5	L6	L5	145
L5	L6	L6	146
L6	L0	L0	147
L6	L0	L1	148
L6	L0	L2	149
L6	L0	L3	150
L6	L0	L4	151

Axis ID 2	Axis ID 1	Axis ID 0	ID TMLCAN
L6	L0	L5	152
L6	L0	L6	153
L6	L1	L0	154
L6	L1	L1	155
L6	L1	L2	156
L6	L1	L3	157
L6	L1	L4	158
L6	L1	L5	159
L6	L1	L6	160
L6	L2	L0	161
L6	L2	L1	162
L6	L2	L2	163
L6	L2	L3	164
L6	L2	L4	165
L6	L2	L5	166
L6	L2	L6	167
L6	L3	L0	168
L6	L3	L1	169
L6	L3	L2	170
L6	L3	L3	171
L6	L3	L4	172
L6	L3	L5	173

Axis ID 2	Axis ID 1	Axis ID 0	ID TMLCAN
L6	L3	L6	174
L6	L4	L0	175
L6	L4	L1	176
L6	L4	L2	177
L6	L4	L3	178
L6	L4	L4	179
L6	L4	L5	180
L6	L4	L6	181
L6	L5	L0	182
L6	L5	L1	183
L6	L5	L2	184
L6	L5	L3	185
L6	L5	L4	186
L6	L5	L5	187
L6	L5	L6	188
L6	L6	L0	189
L6	L6	L1	190
L6	L6	L2	191
L6	L6	L3	192
L6	L6	L4	193
L6	L6	L5	194
L6	L6	L6	195

3.5. Axis ID Selection for iPOS4808 VX-CAT drives with EtherCAT

The iPOS4808 VX-CAT drives support all EtherCAT standard addressing modes. In case of device addressing mode based on node address, the iPOS4808 VX-CAT drive sets 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 of the voltage levels of the AxisID0, AxisID1 and AxisID2 inputs. The AxisID value is computed in the same way as in the case of iPOS4808 VX-CAN drives using the CANopen protocol (see ***Table 3.4***)

   Remark: *any other combination of voltage levels not included in* ***Table 3.4,*** *like for example the levels from* ***Table 3.5****, will set the axis ID equal with 255*.

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

3.6. Installing and configuring the USB drivers

3.6.1. Installing the USB drivers

3.6.1.1 Windows 7

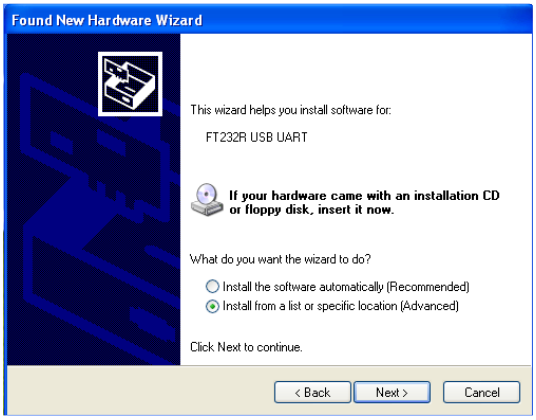
Windows 7 finds the drives automatically. In case your current version of Windows does not automatically detect the USB drivers, download the latest version from here **http://www.ftdichip.com/Drivers/VCP.htm**.

3.6.1.2 Windows XP

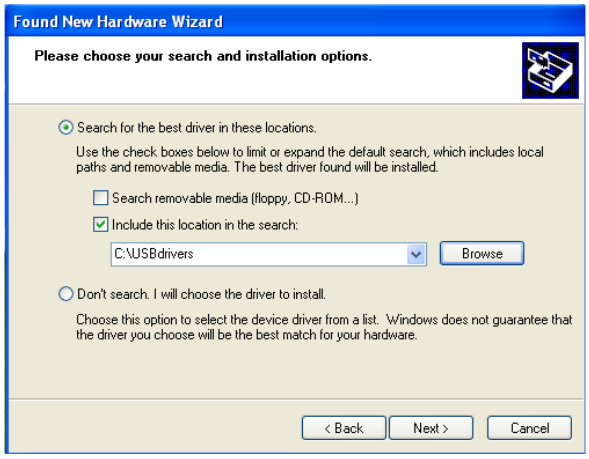
Download the latest drivers for your version of windows from **http://www.ftdichip.com/Drivers/VCP.htm**.

After connecting the USB IO board, Windows XP shows a new hardware found wizard.

Choose “No, not at this time” and the Next button.



In the next dialogue, choose “Install from a list or specific location (Advanced)” and click Next button.



Click Browse button and choose the folder where you have extracted the USB drivers. Click Next button.

After the installing is finished, another new hardware will be detected. Do the same steps as before and give the same location for the drivers.

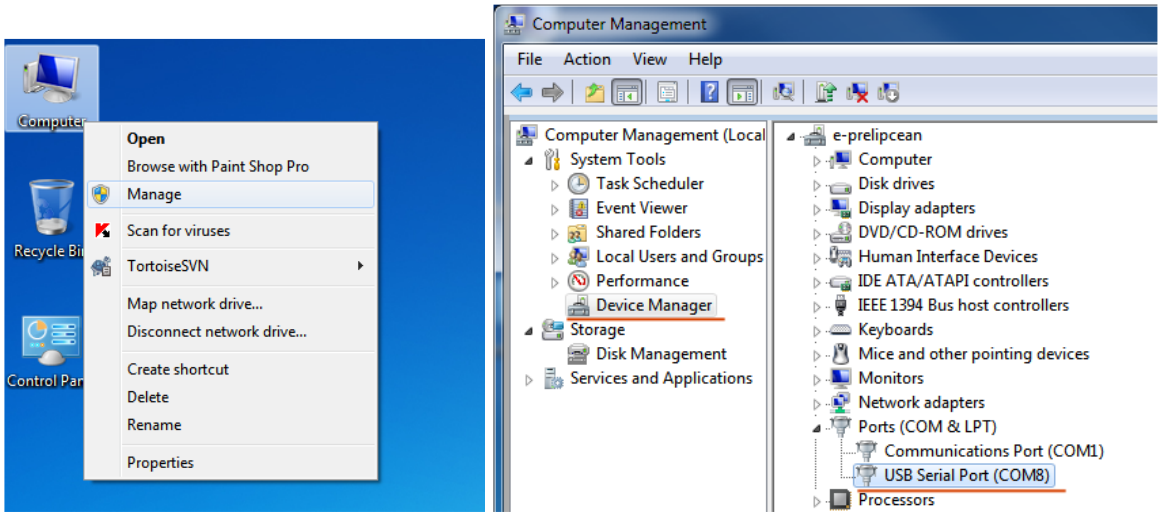
The driver is installed.

3.6.2. USB driver configuration

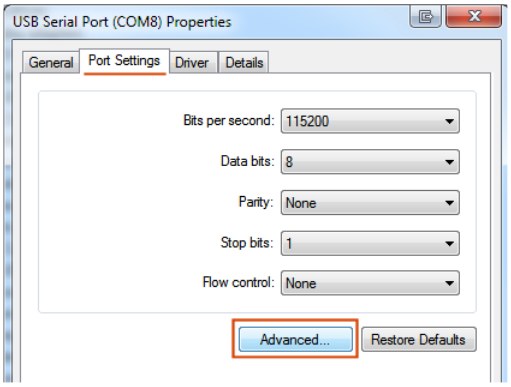
After the drivers are installed follow the steps below to configure the USB driver:

Remark: *The driver configuration procedure is identical for both Windows 7 and Windows XP.*

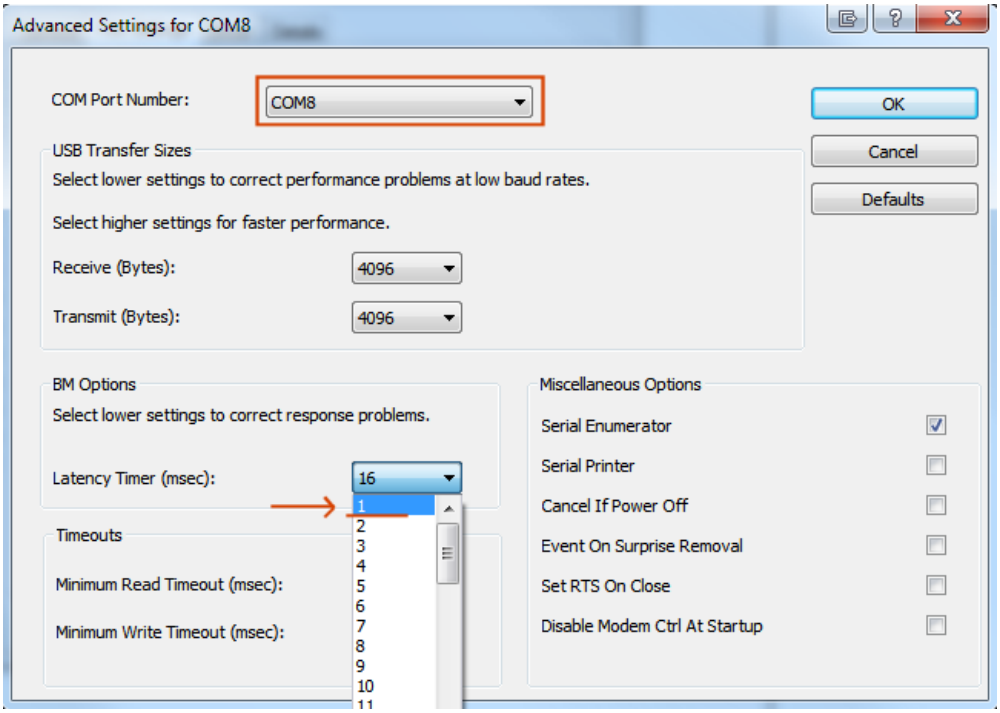
1. Open Computer Management tool and select Device Manager. Expand Ports (COM & LPT) and double click on the USB Serial Port (COMx).



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.

3.7. 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.

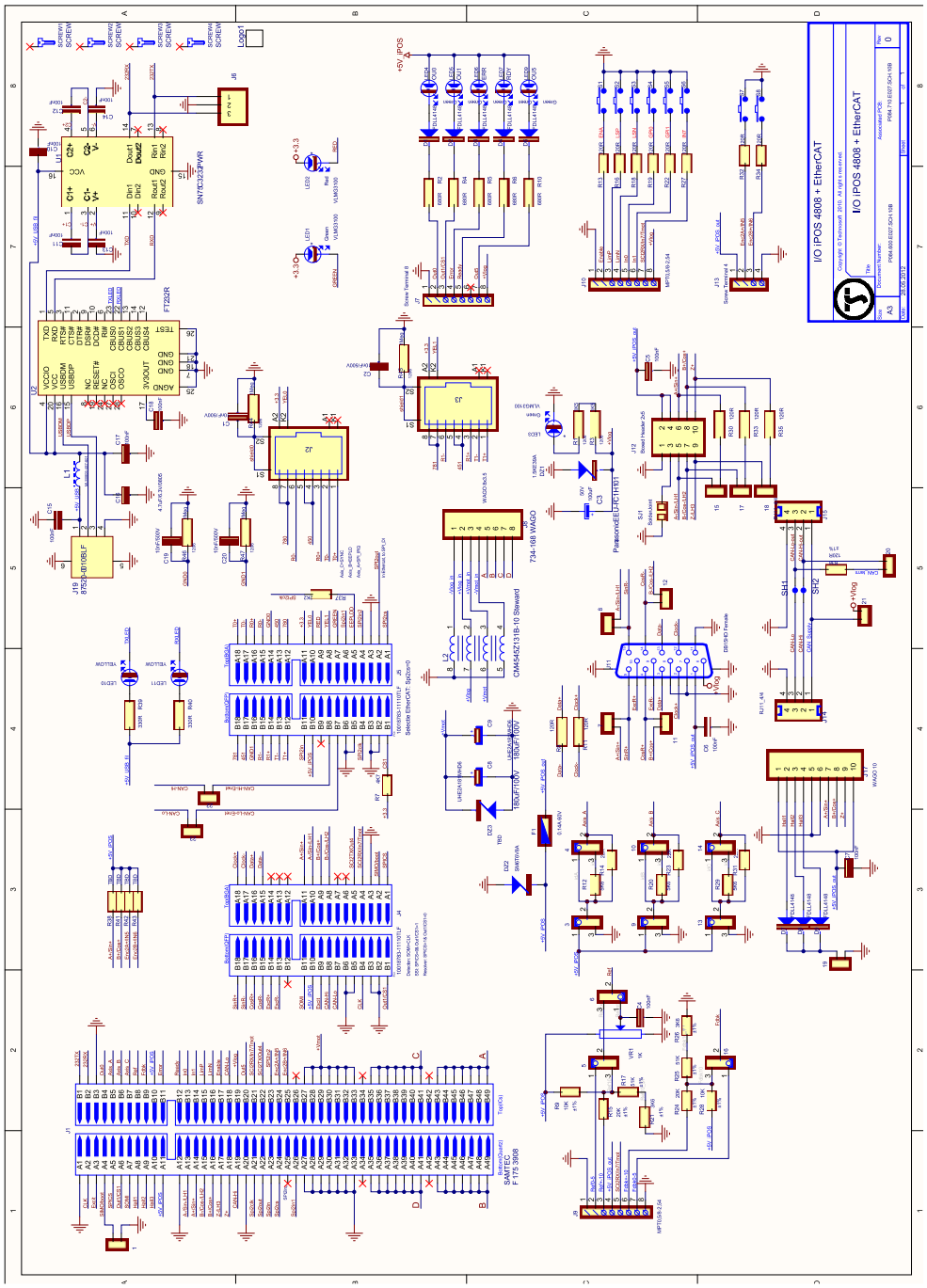
Before the first power up, check the following:

1. **iPOS4808** mounting: it shall be fully inserted in the **IO-iPOS4808** board J1 connector
2. In case an **iPOS4808 VX-CAT** board is used, the **EtherCAT interface module** must also be fully inserted into the **J5** connector
3. Motor connections
4. USB cable connections
5. **IO-iPOS4808** board jumpers: by default the I/O board is delivered with the jumpers in the following positions:
    a. 20 = ON
    b. 1, 7, 8, 11-13, 15, 17 - 19, 21 - 23 = OFF
    c. 4 - 6, 10, 14, 16 = 1-2
    d. 3, 9 = 2 - 3

    The default jumper settings select the TMLCAN protocol with the axisID is 255. In order to quickly change to CANopen protocol, set jumper 13 = 2 - 3. The CANopen axisID set will be 127.
6. Power on the **IO-iPOS4808** board, the LED (**READY**) from **IO-iPOS4808** board should light.

    Note: The drive axisID can also be detected using EasySetUp or EasyMotion Studio and an USB connection. If the USB is connected and the drive is powered, when EasySetUp or EasyMotion Studio application is started, the drive axis ID occurs on the application status bar. If this does not happen, in the dialogue open by menu command *Communication* | *Setup* select at “Axis ID of drive/motor connected to PC is” the option *autodetected* and for the COM port set it as the one in paragraph **3.6.2**. When the dialogue with the correct settings is closed, the drive axis ID will occur in the status bar. For more information about communicating with the drive, consult the iPOS4808 xX-xxx user manual.

Appendix 1: *IO-iPOS4808 schematics*



Appendix 2: *iPOS4808 VX Plug-in Connector Pins*

J1 Connector pinout (A Side)

Connector description

	Pin	Name	Type	Description
J1	A1	GND	-	Return ground for extension bus
	A2	reserved	O	Reserved for interface extensions†
	A3	reserved	O	Reserved for interface extensions†
	A4	reserved	I	Reserved for interface extensions†
	A5	reserved	I/O	Reserved for interface extensions†
	A6	OUT1	O	5-36V 0.5A digital output, NPN O.C. / TTL pull-up
	A7	reserved	I/O	Reserved for interface extensions†
	A8	Hall 1	I	Digital input Hall 1 sensor
	A9	Hall 2	I	Digital input Hall 2 sensor
	A10	Hall 3	I	Digital input Hall 3 sensor
	A11	$+5V_{OUT}$	O	5V supply for sensors - internally generated
	A12	GND	-	Return ground for sensors supply
	A13	A- /Sin- /LH1	I	Incr. encoder A- diff. input, or analogue encoder Sin- diff. input, or linear Hall 1 input
	A14	A/A+/Sin+	I	Incr. encoder A single-ended, or A+ diff. input, or analogue encoder Sin+ diff. input
	A15	B- /Cos/LH2	I	Incr. encoder B- diff. input, or analogue encoder Cos- diff. input, or linear Hall 2 input
	A16	B+/Cos+	I	Incr. encoder B single-ended, or B+ diff. input, or analogue encoder Cos+ diff. input
	A17	Z- /LH3	I	Incr. encoder Z- diff. input, or linear Hall 3 input
	A18	Z+	I	Incr. encoder Z (index) single-ended, or Z+ diff. input
	A19	Can-Hi	I/O	CAN-Bus positive line(dominant high)
	A20	GND	-	Negative return (ground) of the logic supply
	A21-22	reserved	O	Reserved for interface extensions†
	A23-26	reserved	I	Reserved for interface extensions†
	A27-33	GND	-	Negative return (ground) of the motor supply
	A34	reserved	-	Reserved, not connected
	A35-41	Br/B-	O	Brake resistor / Phase B- for 2-ph steppers
	A42	reserved	-	Reserved, not connected
	A43-49	B/A-	O	Phase B for 3-ph motors, A- for 2-ph steppers, Motor- for DC brush motors

† leave unconnected if interface extensions are not used

J1 Connector pinout (B side)

Connector description

J1

Pin	Name	Type	Description
B1	232TX	O	RS-232 Data Transmission
B2	232RX	I	RS-232 Data Reception
B3	GND	-	Return ground for CAN-Bus and RS-232 pins
B4	OUT0	O	5-36V 0.5A general-purpose digital output, NPN open-collector / TTL pull-up
B5	AxisID 0	I	Axis ID/Address input. 7 states: floating, strap to GND or +5V, resistor 4K7 or 22K to GND or +5V
B6	AxisID 1	I	Axis ID/Address input. 7 states: floating, strap to GND or +5V, resistor 4K7 or 22K to GND or +5V
B7	AxisID 2	I	Axis ID/Address input. 7 states: floating, strap to GND or +5V, resistor 4K7 or 22K to GND or +5V
B8	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
B9	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
B10	$+5V_{OUT}$	O	5V output supply for I/O usage
B11	OUT2/Error	O	5-36V 0.5A drive error output, active low, NPN open-collector/TTL pull-up. Also drives the red LED
B12	OUT3/Ready	O	5-36V 0.5A drive ready output, active low, NPN open-collector/TTL pull-up. Also drives the green LED.

J1

Pin	Name	Type	Description
B13	IN0	I	5-36V digital input General-purpose
B14	IN1	I	5-36V digital input
B15	IN2/LSP	I	5-36V digital input Positive limit switch input
B16	IN3/LSN	I	5-36V digital input. Negative limit switch input
B17	IN4/Enable	I	5-36V digital input. Drive enable input
B18	Can-Lo	I/O	CAN-Bus negative line (dominant low)
B19	$+V_{LOG}$	I	Positive terminal of the logic supply: 9 to $36V_{DC}$
B20	OUT5	O	5-36V 0.5A digital output, NPN O.C. / TTL pull-up
B21	IN7	I	5-36V digital input
B22	reserved	-	Do not connect
B23	reserved	I	Reserved for interface extensions†
B24	IN5	I	5-36V digital input General-purpose
B25	IN6	I	5-36V digital input General-purpose
B26	reserved	-	Reserved, not connected
B27-33	$+V_{MOT}$	I	Positive terminal of the motor supply: 11 to $50V_{DC}$
B34	reserved	-	Reserved, not connected
B35-41	C/B+	O	Phase C for 3-ph motors, B+ for 2-ph steppers
B42	reserved	-	Reserved, not connected
B43-49	A/A+	O	Phase A for 3-ph motors, A+ for 2-ph steppers, Motor+ for DC brush motors

† leave unconnected if interface extensions are not used

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