



# Ethernet-CAN Adapter

T E C H N O S O F T

## User Manual



# Ethernet-CAN Adapter User Manual

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## Read This First

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### ***About This Manual***

This book is a technical reference manual for the Ethernet-CAN Adapter.

This manual explains in detail how to configure an Ethernet-CAN Adapter using the Ethernet-CAN adapter Configuration Software.

### ***Notational Conventions***

This document uses the following conventions:

**TML** – Technosoft Motion Language

**Faxx** – firmware versions with A = 0, 1, 2, 3, 4 or 9; Examples: F005K, F120B, F900H

**FBxx** – firmware versions with B = 5, 6, 7, 8; Examples: F500B, F600C, F800I

**SI units** – International standard units (meter for length, seconds for time, etc.)

**IU units** – Internal units of the drive

**ESM** – EasyMotion Studio

**LAN** – Local Area Network

### ***Related Documentation***

***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**

***Help of the EasyMotion Studio software*** – describes how to use the EasyMotion Studio to create motion programs using in Technosoft Motion Language (TML). EasyMotion

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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**

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***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 Buchaux 38 CH-2022 Bevaix, NE Switzerland

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## Contents

<b>Read This First .....</b>	<b>I</b>
<b>1. Key Features.....</b>	<b>1</b>
<b>2. Connectors and Connections Diagrams .....</b>	<b>2</b>
2.1. Adapter Drawing.....	2
2.2. J1 Connector Pinout.....	3
2.3. Installing the Ethernet-CAN Adapter .....	3
<b>3. Ethernet Communication Setup.....</b>	<b>3</b>
3.1. Getting Started with Ethernet-CAN Adapter Configuration Software.....	3
3.2. Searching for Ethernet-CAN Adapters .....	4
3.3. Changing the configuration of an Ethernet-CAN Adapter.....	5
<b>4. Set EasyMotion Studio for communication via Ethernet.....</b>	<b>6</b>
<b>5. Ethernet Communication Troubleshoot.....</b>	<b>8</b>

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# 1. Key Features

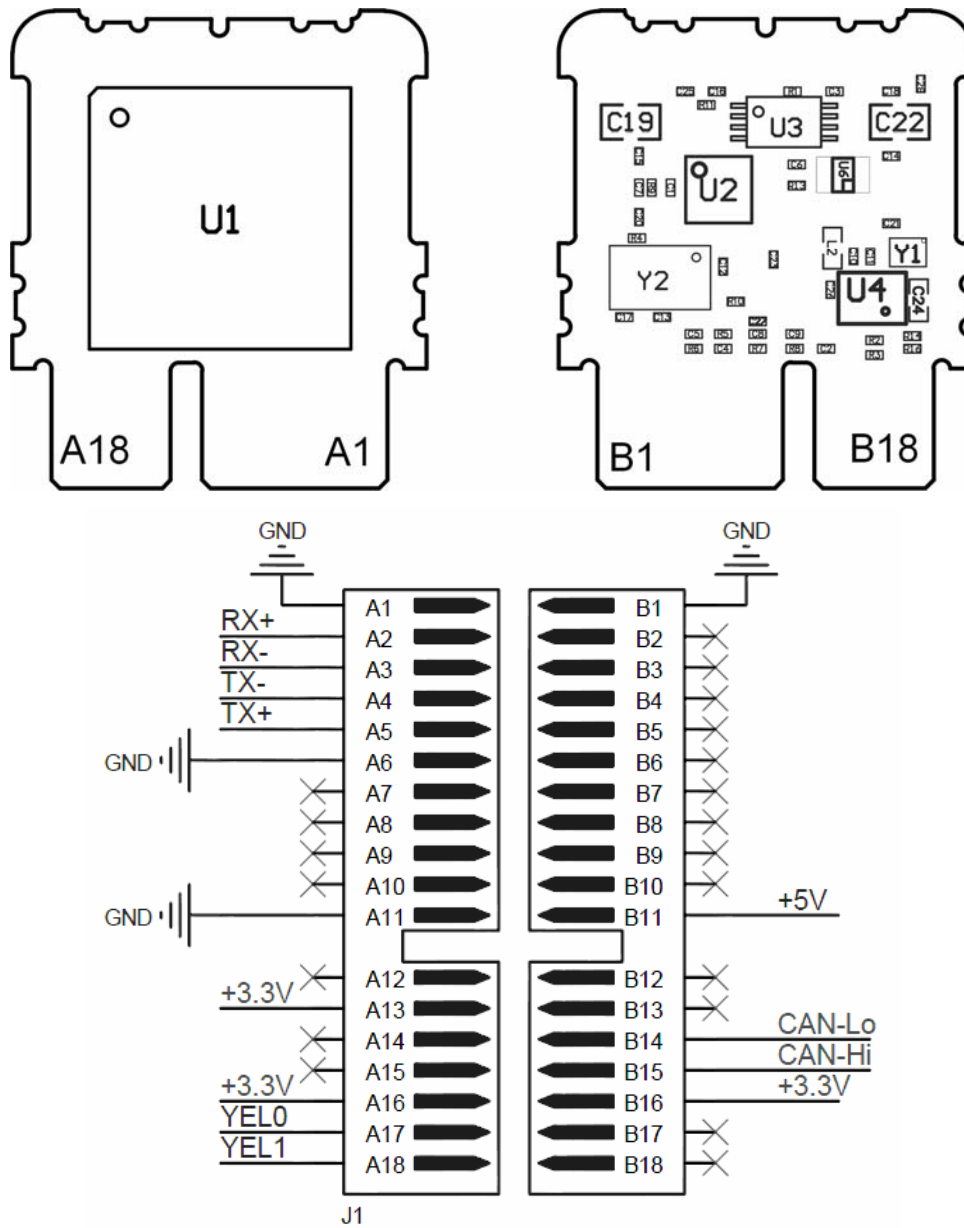
The Ethernet-CAN Adapter is an interface module which allows the access to a CAN network of Technosoft drives, via an Ethernet connection. Once the adapter is connected to the CAN network on one side, and to the Ethernet line to the other, one can communicate with any of the drives from the CAN network, using the EasyMotion Studio environment, or a user application which encapsulates TML protocol in UDP and TCP/IP messages. Thus, setup, motion programming, on-line motion commands and system diagnosis can be accomplished remotely via the Ethernet connection.

Key features of the Ethernet-CAN Adapter are:

- Compatible with all Technosoft intelligent drives
- CAN communication up to 1Mbps using Technosoft communication protocol
- Ethernet communication:
  - 10 BASE-T / 100 BASE-TX, full/half duplex
  - TCP/UDP Socket Services
- Power supply: 12-48 V
- Compact size
- Operating ambient temperature: 0-40°C

## 2. Connectors and Connections Diagrams

### 2.1. Adapter Drawing



## 2.2. J1 Connector Pinout

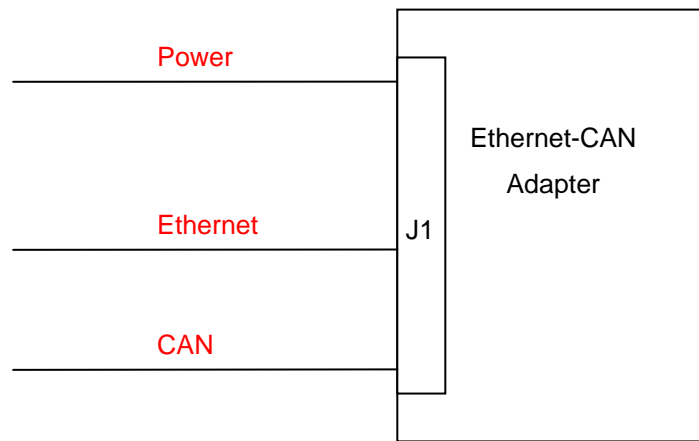
Connector description			
Pin	Name	Type	Description
A1	GND	-	Return ground
A2	RX+	I	Ethernet Receive Data+
A3	RX-	I	Ethernet Receive Data-
A4	TX-	O	Ethernet Transmit Data-
A5	TX+	O	Ethernet Transmit Data+
A6	GND	-	Return ground
A7	reserved	-	Reserved
A8	reserved	-	Reserved
J1 A9	reserved	-	Reserved
A10	reserved	-	Reserved
A11	GND	-	Return ground
A12	reserved	-	Reserved
A13	+3.3V	O	+3.3V supply
A14	reserved	-	Reserved
A15	reserved	-	Reserved
A16	+3.3V	O	+3.3V supply
A17	YEL0	O	Ethernet LED0
A18	YEL1	O	Ethernet LED1

Connector description			
Pin	Name	Type	Description
B1	GND	-	Return ground
B2	reserved	-	Reserved
B3	reserved	-	Reserved
B4	reserved	-	Reserved
B5	reserved	-	Reserved
B6	reserved	-	Reserved
B7	reserved	-	Reserved
B8	reserved	-	Reserved
J1 B9	reserved	-	Reserved
B10	reserved	-	Reserved
B11	+5V	I	+5V supply
B12	reserved	-	Reserved
B13	reserved	-	Reserved
B14	CAN LO	I/O	CAN-Bus negative line (dominant low)
B15	CAN HI	I/O	CAN-Bus positive line (dominant high)
B16	+3.3V	O	+3.3V supply
B17	reserved	-	Reserved
B18	reserved	-	Reserved

## 2.3. Installing the Ethernet-CAN Adapter

In order to be configured, the Ethernet-CAN Adapter needs to be powered and connected to the LAN.

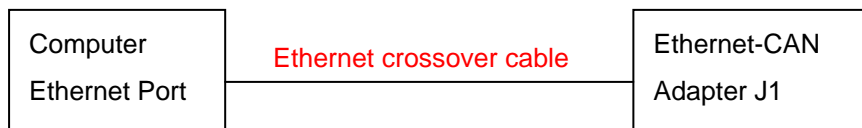
**The Ethernet-CAN Adapter will not start unless the Ethernet Link is active.**



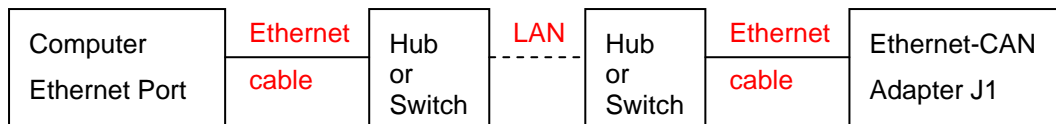
**Figure 1 –Ethernet-CAN Adapter Connections**

The Ethernet Link can be established by connecting the Ethernet-CAN Adapter directly to the computer or by using one or more hubs/switches.

If the Ethernet-CAN Adaptor is connected directly to the computer, an Ethernet crossover cable is needed. For more details about crossover cables please see [http://en.wikipedia.org/wiki/Ethernet\\_crossover\\_cable](http://en.wikipedia.org/wiki/Ethernet_crossover_cable).



**Figure 2 – Connecting the Ethernet-CAN Adapter directly to a computer**



**Figure 3 – Connecting the Ethernet-CAN Adapter by using one or more hubs/switches**

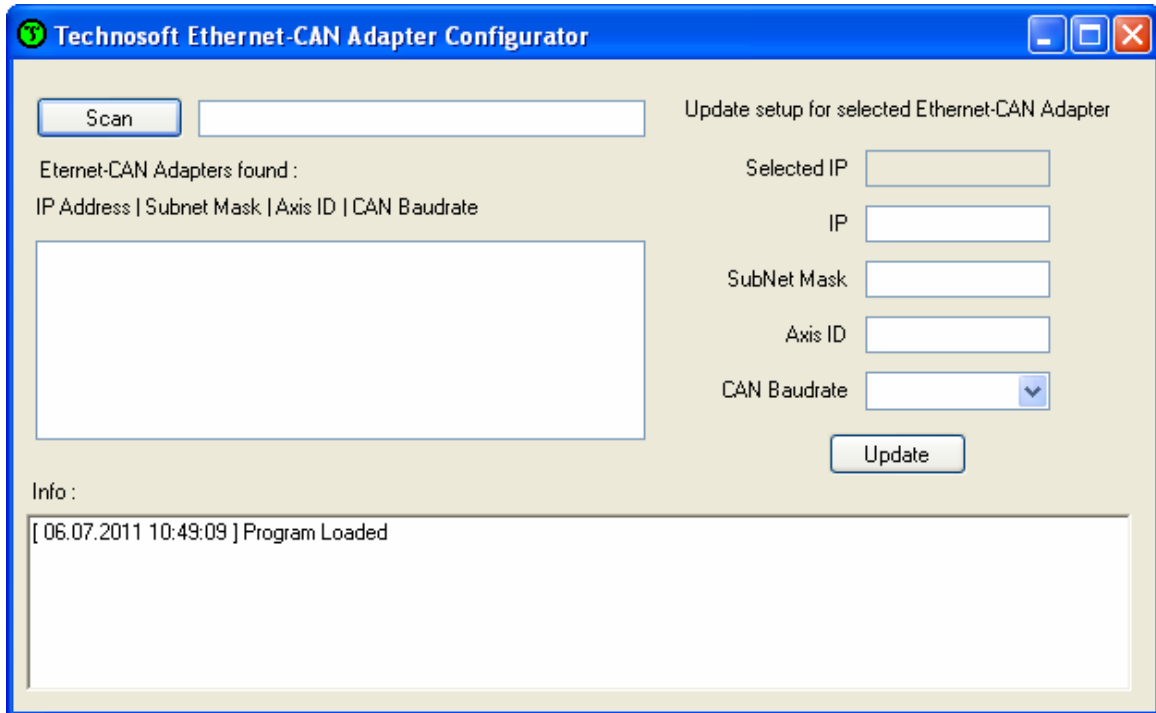
### 3. Ethernet Communication Setup

#### 3.1. Getting Started with Ethernet-CAN Adapter Configuration Software

The Ethernet-CAN Adapter Configuration Software is a configuration tool used to find and configure the setup of any Technosoft Ethernet-CAN Adapters located in the LAN.

The Ethernet-CAN Adapter Configuration Software is available for download on the Technosoft webpage, <http://www.technosoftmotion.com>.

The Configuration Software can search the LAN for Ethernet-CAN Adapters and update their parameters (IP address, Subnet Mask, Axis ID, CAN Baud rate).

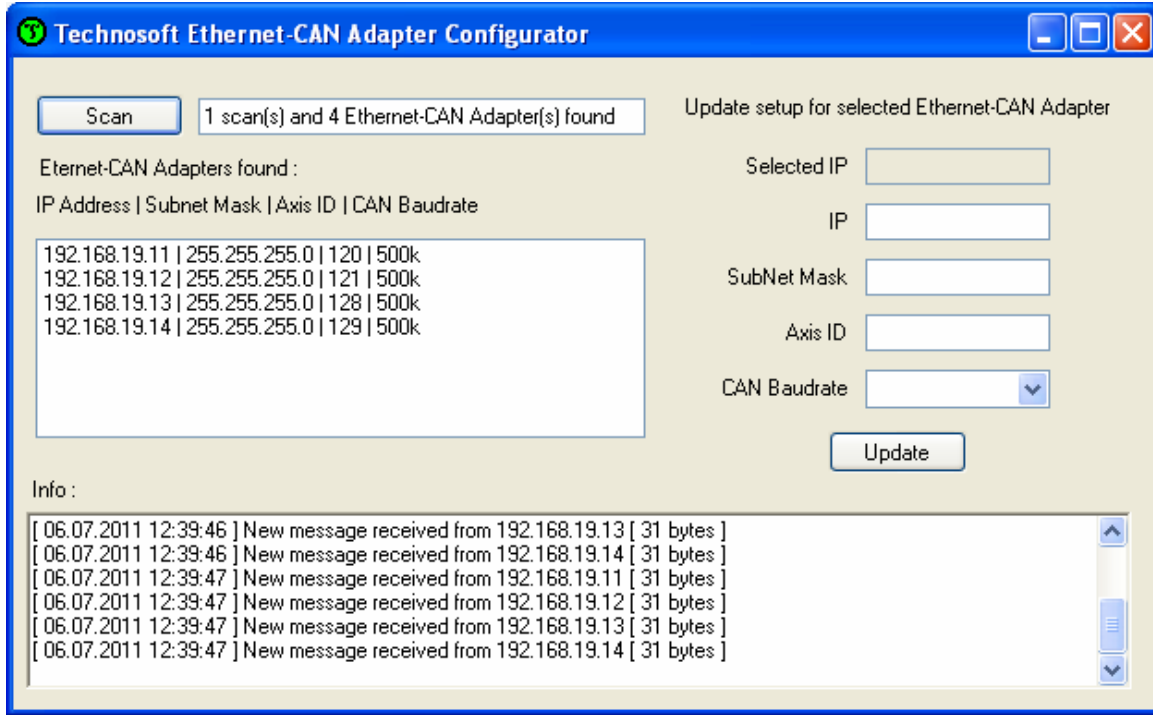


**Figure 4 – Ethernet-CAN Adapter Configuration Software main window**

### 3.2. Searching for Ethernet-CAN Adapters

If using EasyMotion Studio, before starting Ethernet-CAN Adapter Configuration program please make sure to select Work Offline in Communication menu to avoid any errors.

In order to configure an Ethernet-CAN Adapter, the LAN must be scanned first. By pressing the **Scan** button (see Figure 5) a broadcast message will be sent and all the Ethernet-CAN Adaptors that are present in the LAN (powered on and with active Ethernet link) will reply with their setup information.



**Figure 5 – Ethernet-CAN Adaptor Configuration Software scan result**

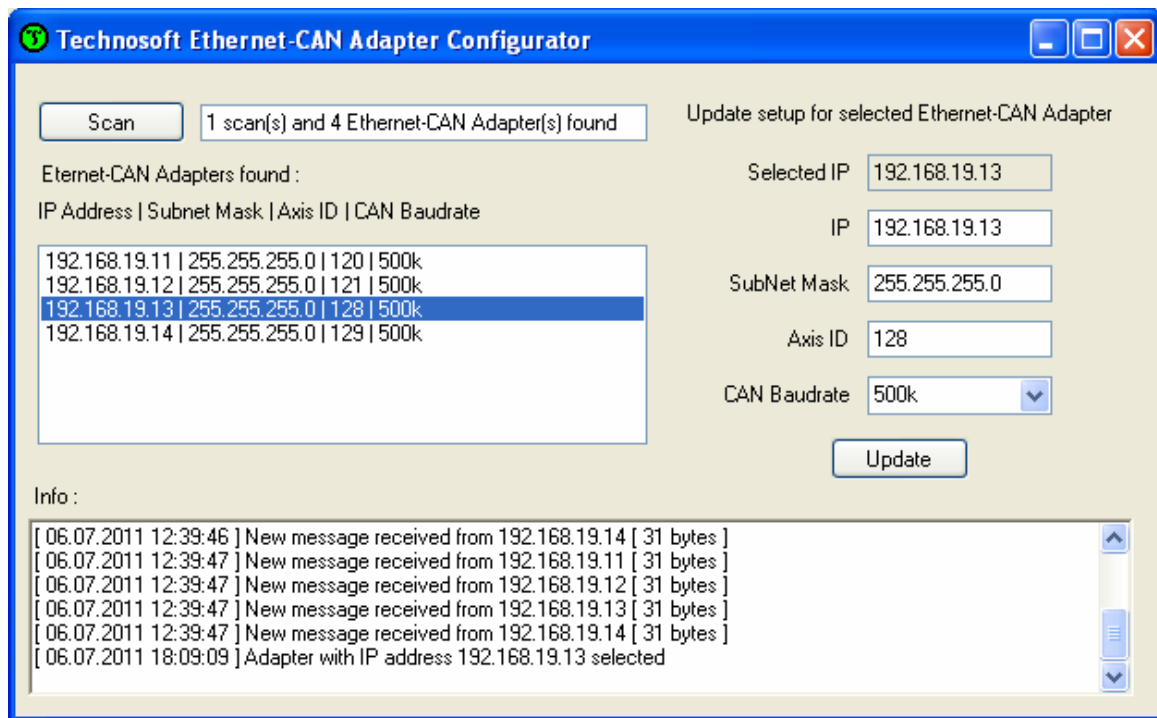
All the adaptors that are found are placed in a list with the following format :

- IP Address | Subnet Mask | Axis ID | CAN Baudrate



### 3.3. Changing the configuration of an Ethernet-CAN Adapter

Selecting an adaptor from the list copies its setup in the right fields, where they can be modified.



**Figure 6 - Ethernet-CAN Adaptor Configuration Software with an item selected**

The default configuration for an Ethernet-CAN Adapter is :

Parameter	Default value
IP Address	192.168.19.11
Subnet Mask	255.255.255.0
CAN Baudrate	500kbps
Axis ID	120

After the setup has been modified, by clicking the **Update** button the new setup is sent to the selected Ethernet-CAN Adapter.

Once the setup of an Ethernet-CAN adapter is finalized, the board can be connected to a CAN network where Technosoft drives are also connected, and through an Ethernet line, to a PC where the EasyMotion Studio platform is executed. Thus, the user can access via the Ethernet connection any of the drives, setup it, program it, and visualize its operation.

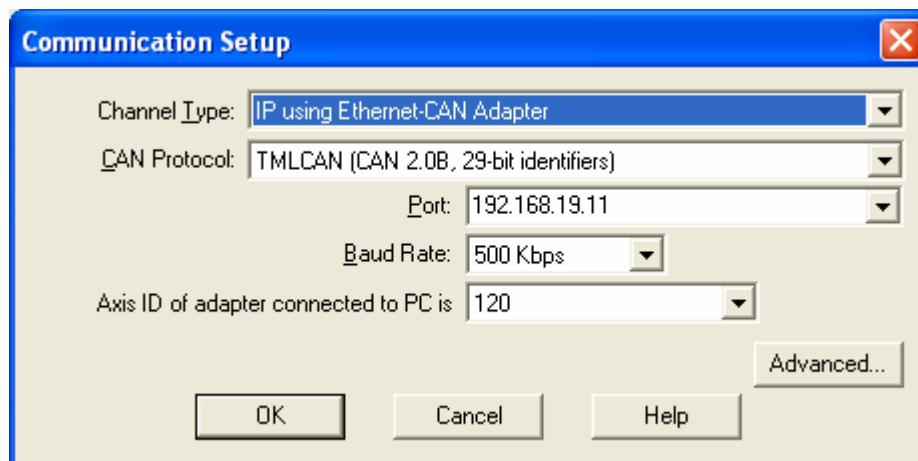
## 4. Set EasyMotion Studio for communication via Ethernet

Steps to follow:

1. Set the AxisID for each Technosoft drive/motor. Connect all drives/motors in the multiple-axis CAN network if you have more than one drives/motors.

The drives/motors axis ID is set at power on using the following algorithm:

- a. If the setup table is valid, with the value read from the EEPROM setup table containing all the setup data.
  - b. If the setup table is invalid, with the last axis ID value read from a valid setup table.
  - c. If there is no axis ID set by a valid setup table, with the value read from the hardware switches/jumpers for AxisID setting. If the drive/motor has no hardware switches/jumpers for axis ID setting, with the default axis ID value which is 255.
2. Power-off all your drives/motors and the Ethernet / RS-232 Adapter.
  3. Connect the Ethernet-CAN Adapter to the CAN network.
  4. Power-on the drives/motors and the Ethernet-CAN Adapter.
  5. Select menu command "**Communication | Setup**" in EasyMotion Studio software.



6. Select **IP using Ethernet-CAN Adapter** at **Channel Type**.
7. Set the **CAN Protocol** to **TMLCAN (CAN2.0B, 29-bit identifier)**.
8. At "**Port**", set the IP address of the Ethernet-CAN Adapter.
9. Select the desired baud rate for CAN communication from **Baud Rate** list.
10. Set the **Axis ID of the adapter connected to PC**. **REMARK: use a different Axis ID than the ones of the drives in the CAN network.**

11. Press the **OK** button

If the communication works properly, you'll see displayed on the status bar (the bottom line) of the EasyMotion Studio the text "**Online**", the axis ID of the drive/motor and the firmware version read from the drive/motor.

**Remarks**

- *To access the Ethernet-CAN Adapter from a remote PC (a PC which is not in the same LAN as the Ethernet / RS-232 Adapter), the server's (or router's) port forwarding must be set to allow communication. The port numbers that must be forwarded are UDP/TCP: 1700 and UDP: 30689. Port forwarding allows remote computers to connect to a specific computer within a private local area network (LAN). For more information about port forwarding, refer to the instructions supplied with the router.*
- *On the remote PC, the server's (router's) IP address will be used in the Communication Setup dialogue in EasyMotion Studio software.*

For more details on communication setup at the level of EasyMotion Studio, see EasyMotion Studio User Manual / Help.

## 5. Ethernet Communication Troubleshoot

If the Ethernet or CAN-bus communication does not operate properly, EasyMotion Studio will issue an error message and you'll see displayed on the status bar (the bottom line) of the EasyMotion Studio the text "**Offline**".

1. If the error message starts with "**WinSock:** " the error is related to Ethernet communication. Click "**Cancel**" button, then check the following:
  - UTP cable connections
  - If the Ethernet adapter is correctly supplied
  - In **Communication | Setup** dialogue, if the address set at **Port** is identical with the one set with Ethernet-CAN Adapter Configuration Software.
2. If the error message doesn't start with "**WinSock:** " the error is related to the CAN-bus communication or the drive/motor. To fix the problem see EasyMotion Studio Help.
3. If the communication operates usually but gives communication errors from time to time, in **Communication | Setup** click on **Advanced...** button and increase the **Receive timeout interval** parameter. Note that for this parameter, usually, the default value does not need to be modified.

After you fix the problem, execute menu command **Communication | Refresh** to restore the communication.



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