DeviceNet Slave Device

CAN-2057D-32

User's Manual

Warranty

Without contrived damage, all products manufactured by ICP DAS are warranted in one year from the date of delivery to customers.

Warning

ICP DAS revises the manual at any time without notice. However, no responsibility is taken by ICP DAS unless infringement act imperils to patents of the third parties.

Copyright

Copyright © 2026 is reserved by ICP DAS.

Trademark

The brand name ICP DAS as a trademark is registered, and can be used by other authorized companies

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Contents

1 INTRODUCTION 3

1.1 OVERVIEW 3
1.2 HARDWARE SPECIFICATIONS 4
1.3 FEATURES 5
1.4 APPLICATION 5

2 HARDWARE 6

2.1 STRUCTURE 6
2.2 NODE ID & BAUD RATE ROTARY SWITCH 7
2.3 LED DESCRIPTION 8
2.4 PIN ASSIGNMENT 10

3 DEVICENET PROFILE AREA 12

3.1 DEVICENET STATEMENT OF COMPLIANCE 12
3.2 IDENTITY OBJECT (CLASS ID: 0X01) 13
3.3 CONNECTION OBJECT (CLASS ID:0X05) 14
3.4 ASSEMBLY OBJECT (CLASS ID: 0X04) 15
3.5 APPLICATION OBJECT1 (CLASS ID: 0X64) 17

4 APPLICATION 19

5 FIRMWARE UPDATE 22

APPENDIX A: DIMENSION 25

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1 Introduction

1.1 Overview

DeviceNet is one kind of the network protocols based on the CAN bus and mainly used for the embedded network of the machine control, such as industrial machine control , aircraft engines monitoring, factory automation, medical equipments control, remote data acquisition, environmental monitoring, and packaging machines control, etc.

CAN-2057D-32 complies with the DeviceNet specification Volume I/II, Release 2.0. Users can access the digital I/O status and configure settings through the DeviceNet EDS file. This module features 32-channel isolated Sink outputs, making it suitable for developing powerful and cost-effective digital control systems. If you have an ICP DAS DeviceNet master device, you can quickly establish a DeviceNet network to meet your requirements.



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.2 Hardware Specifications

Digital Output:

- Output Channels: 32 (Sink)
- DO Load Voltage: +5 ~ +30 V_{DC}
- Output Max Load Current: 100 mA.
- Output Type: Open-Collector.
- Intra-module Isolation: 3750 Vrms
- ESD Protection: 4 kV Contact for each channel

Others:

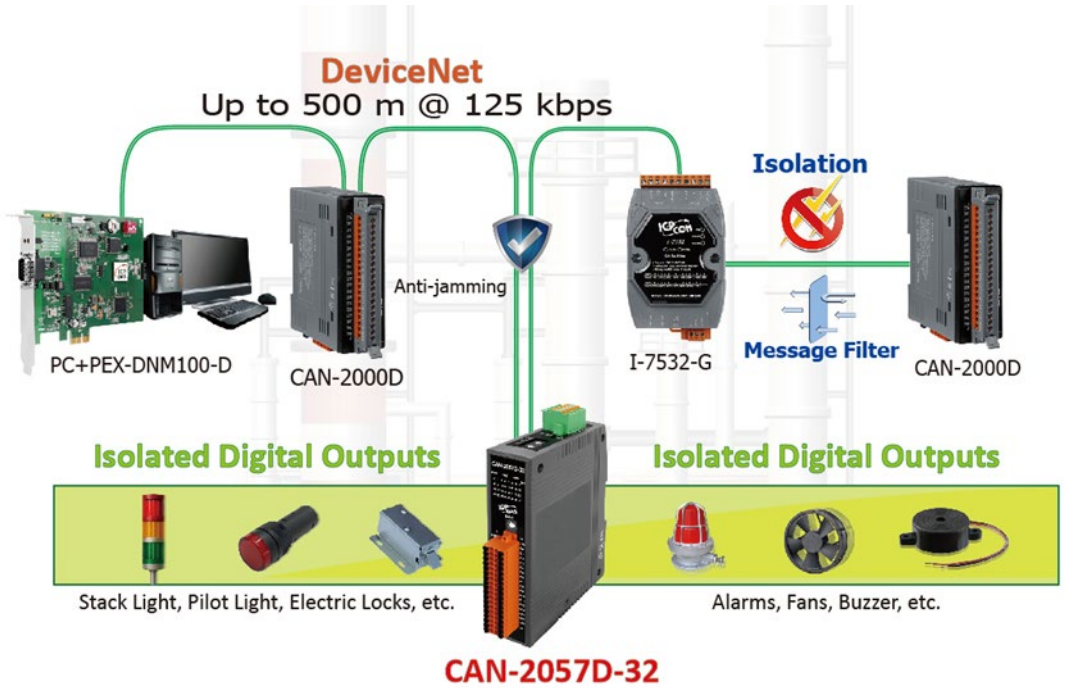
- DeviceNet Status: 3 LEDs for PWR / NET / MOD.
- 1 terminal resistor LED
- 32 digital output LEDs.
- 120 Ω DIP-switch terminal resistor.
- Power Supply: Unregulated +10 ~ +30 VDC.
- Power Consumption: 2 W
- Operating Temperature: -25 ~ 75 ℃.
- Storage Temperature: -30 ~ 80 ℃.
- Humidity: 10 to 90% RH, Non-condensing..
- Dimensions: 31 mm x 165 mm x 129 mm (W x L x H) .

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.3 Features

- DeviceNet general I/O slave devices.
- Comply with DeviceNet specification Volume I, Release 2.0 & Volume II, Release 2.0, Errata 5
- Group 2 Only Server (non UCMM-capable)
- Support Predefined Master/Slave Connection Set.
- Connection supported:
  - 1 connection for Explicit Messaging
  - 1 connection for Polled I/O
  - 1 connection for Bit-Strobe I/O connection
- Support DeviceNet heartbeat and shutdown messages
- Provide EDS file for standard DeviceNet master interface.
- NET, MOD and PWR Led indictors

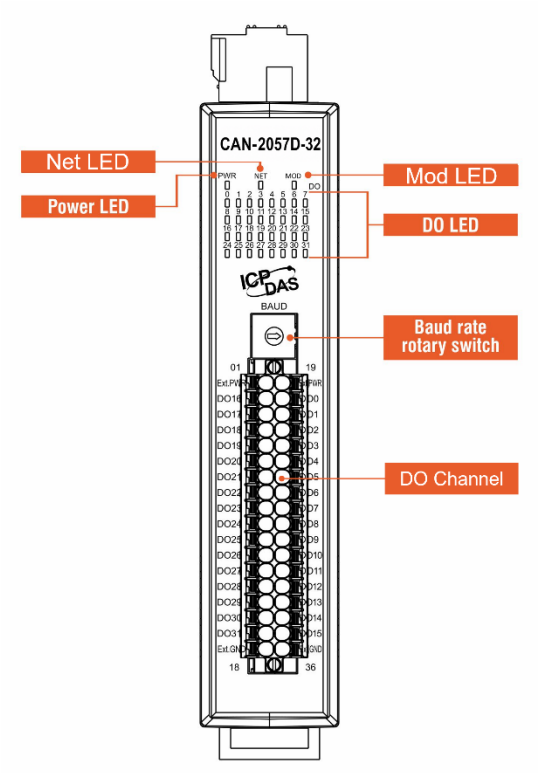
1.4 Application



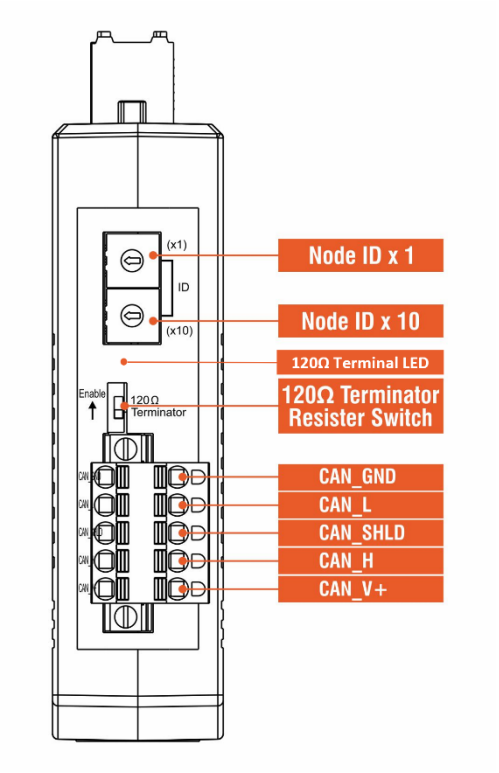
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2 Hardware

2.1 Structure



(Top View)

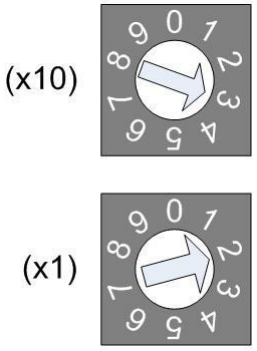


(Side View)

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.2 Node ID & Baud Rate Rotary Switch

The rotary switches of node ID configure the node ID of CAN-2057D-32 module. These two switches are for the tens digit and the units digit of the node ID. The node ID value of this demo picture is 32.



Node ID rotary switch

The rotary switch for baud rate handles the CAN baud rate of CAN-2057D-32 module. The relationship between the rotary switch value and the practical baud rate is presented in the following table.



Baud rate rotary switch

Rotary Switch Value	Baud rate (kbps)
0	125
1	250
2	500

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.3 LED Description

PWR LED

The CAN-2057D-32 needs the power of 10 ~ 30 VDC. Under a normal connection, a good power supply and a correct voltage selection, as the unit is turned on, the LED will light up in red.

NET LED

The NET LED indicates the current status of the DeviceNet communication link.

condition	status	indicates
Init Off	Off line	Device is not online
Off	Connection timeout	I/O connection timeout
Flashing	On line	Device is on line, but not communicating
Init solid	Link failed	(Critical) Device has detected an error that has rendered it incapable of communicating on the link; for example, detected a duplicate node address or network configuration error
Solid	On line, communicating	Device is online and communicating

MOD LED

This LED provides the devices status. It indicates whether or not the device is operating properly.

condition	status	indicates
Off	Normal	
Solid	Critical fault	Device has unrecoverable fault.
Flashing	Non_critical fault	Device has recoverable fault to recover. If users want to fix the problem, reconfiguring device's MAC ID or resetting device may work.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Terminal Resistor LED

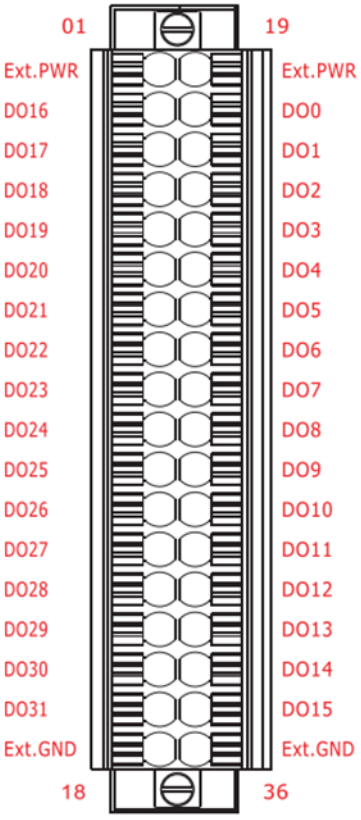
When enable the 120Ω terminator resistor, the LED will be turned on.

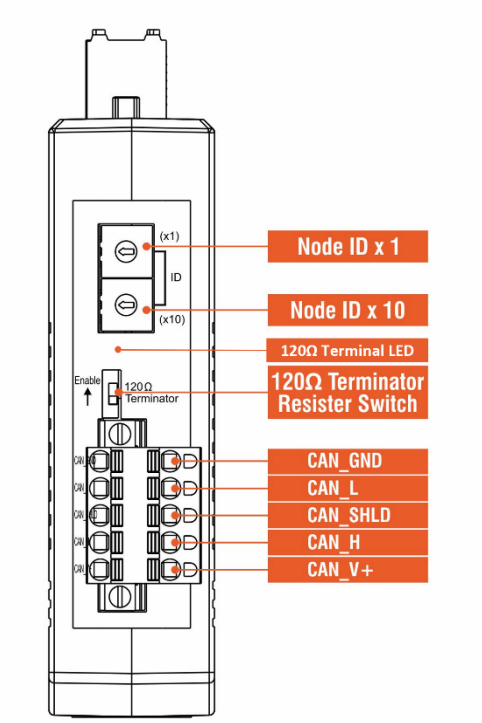
DO LED

If the DO LED is turned on, it means that the corresponding DO channel is active.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

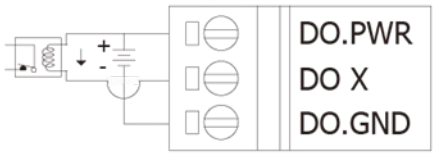
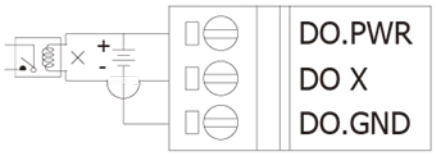
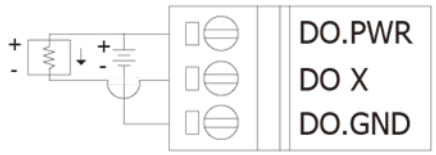
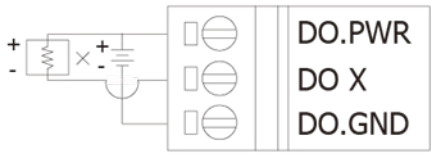
2.4 PIN Assignment



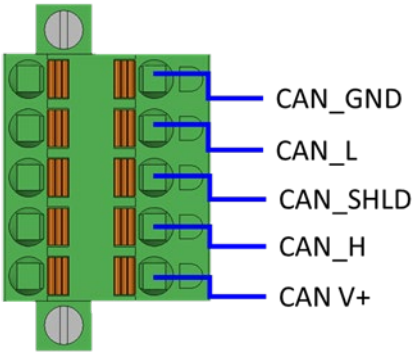


Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.5 Wire Connection

Output Type	ON State LED ON Readback as 1	OFF State LED OFF Readback as 0
Drive Relay	Relay ON	Relay Off
		
Resistance Load		
		

5P push-in pluggable terminal block, 10 wire entries



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3 DeviceNet Profile Area

This section describes the detailed functions for each object class that is implemented in the CAN-2057D-32 DeviceNet network.

3.1 DeviceNet Statement of Compliance

General Device Data

Device Information	Description
Version Description of DeviceNet Specification	Volume I, Release 2.0 & Volume II, Release 2.0
Vendor Name	ICP DAS
Device Profile Name	CAN-2057D-32
Production Revision	1.1

DeviceNet Physical Conformance Data

Item	Description
LED Support	Yes
MAC ID Setting	Switch (0 ~ 63)
Default MAC ID	1
Communication Baud Rate Setting	Switch (125, 250, 500 kbps)
Default Baud Rate	125 kbps
Predefined Master/Slave Connection Set	Group 2 Only Server

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.2 Identity Object (Class ID: 0x01)

This object provides the identification of and general information about the device

Class Attribute (Instance ID=0)

Attribute ID	Attribute name	Data Type	Method	Value
0x01	Revision	UINT	Get	0001
0x02	Max Instance	UINT	Get	1

Class Service

Service Code	Service name	Support
0x0E	Get_Attribute_Single	Yes

Instance Attribute (Instance ID=1)

Attribute ID	Description	Method	DeviceNet Data Type	Value
1	Vendor	Get	UINT	803
2	Product type	Get	UINT	0x00
3	Product code	Get	UINT	0x201
4	Major. Minor of firmware version	Get	Struct of USINT USINT	1.1
5	Status	Get	WORD	-
6	Serial number	Get	UDINT	1
7	Product name	Get	Short_String	CAN-2057D-32
10	Heartbeat Interval	Get/Set	USINT	0(default)

Instance Service

Service Code	Service name	Support
0x0E	Get_Attribute_Single	Yes
0x10	Set_Attribute_Single	Yes
0x05	Reset	Yes

Note: Use the Instance Service 0x05 will reboot the device.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.3 Connection Object (Class ID:0x05)

This section presents the externally visible characteristics of the Connection Objects associated with the Predefined Master/Slave Connection Set within slave devices.

The default IO connection path is as follow

Connection Path	Class ID	Instance ID	Attribute ID
Poll Produced	0x04	0x64	0x03
Poll Consumed	0x04	0x64	0x03
Bit Strobe Produced	0x04	0x64	0x03
Bit Strobe Consumed	0x65	0x01	0x01

Connection Instance ID	Description
1	References the Explicit Messaging Connection into the Server
2	References the Poll I/O Connection
3	References the Bit–Strobe I/O Connection

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.4 Assembly Object (Class ID: 0x04)

The Assembly Object binds attributes of multiple objects, which allows data to or from each object to be sent or received over a single connection. Assembly objects can be used to bind input data or output data. The terms of ”input” and ”output” are defined from the network’s point of view. An input will produce data on the network and an output will consume data from the network

Class attribute (Instance ID=0)

Attribute ID	Attribute name	Data Type	Method	Value
0x01	Revision	UINT	Get	1
0x02	Max Instance	UINT	Get	0x02

Class service

Service Code	Service name	Support
0x0E	Get_Attribute_Single	Yes

Instance ID

Instance ID	OUTPUT	INPUT
0x64	Set DO value	Get DO value

Contents of Each Assembly Object Instance

Instance ID	Description	Type	Method	Default Value
0x64	Channel 0 ~ 31 DO value	UINT	Get/Set	0x00000000

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Parameter description of Assembly Object Instance

Instance ID	Data Range	Parameter Description
0x64	0x00000000 ~ 0xFFFFFFFF	Bit 0 => channel 0 DO value Bit 1 => channel 1 DO value … Bit 31 => channel 31 DO value

Note: x is channel number of module

Instance attribute (Instance ID=0x64)

Attribute ID	Description	Method	DeviceNet Data Type	Value
0x03	Data	Get/Set	OUTPUT/ INPUT	Dependent on instance ID

Instance service

Service Code	Service name	Support
0x0E	Get_Attribute_Single	Yes
0x10	Set_Attribute_Single	Yes

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.5 Application Object1 (Class ID: 0x64)

Application objects are the interfaces between an application and the DeviceNet Layer. The attributes of application Objects contain the data for the application, which are accessed and exchanged via DeviceNet. DeviceNet accesses application data by invoking read and write functions. These functions need to be provided by an Application Object. DeviceNet provides Get_Attribute_Single and Set_ Attribute_Single to read and write CAN-2057D-32 module.

Application Object1 defines pulse output channels configuration.

Class attribute (Instance ID=0)

Attribute ID	Attribute name	Data Type	Method	Value
0x01	Revision	UINT	Get	1
0x02	Max Instance	UINT	Get	0x06

Class service

Service Code	Service name	Support
0x0E	Get_Attribute_Single	Yes

Instance attribute (Instance ID=0x01)

Attribute ID	Description	Method	Data Type	Default Value
0x01	DO value	Get/Set	UINT	0x00
0x02	DO power on value	Get/Set	UINT	0x00
0x03	DO safe value mask	Get/Set	UINT	0x00
0x04	DO safe value	Get/Set	UINT	0x00
0x05	Save all Configuration to EEPROM	Set	UINT	-

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Parameter description of Application Object1 attributes

Attribute ID	Data Range	Parameter Description
0x01	0x00000000 ~ 0xFFFFFFFF	Bit 0 => channel 0 DO value Bit 1 => channel 1 DO value … Bit 31 => channel 31 DO value
0x02	0x00000000 ~ 0xFFFFFFFF	Bit 0 => channel 0 DO power on value Bit 1 => channel 1 DO power on value … Bit 31 => channel 31 DO power on value
0x03	0x00000000 ~ 0xFFFFFFFF	Bit 0 => channel 0 DO safe value mask Bit 1 => channel 1 DO safe value mask … Bit 31 => channel 31 DO safe value mask Bit value=1 => apply safe value setting Bit value=0 => apply DO output value
0x04	0x00000000 ~ 0xFFFFFFFF	Bit 0 => channel 0 DO safe value Bit 1 => channel 1 DO safe value … Bit 31 => channel 31 DO safe value
0x05	0x01: Use default configuration 0x02: Save all Configuration to EEPROM	0x01: After restarting the device, configuration will become factory setting. 0x02: Save all channels configuration into EEPROM

Instance service

Service Code	Service name	Support
0x0E	Get_Attribute_Single	Yes
0x10	Set_Attribute_Single	Yes

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4 Application

Application Object1 (Class ID:0x64) lists all the parameters of the module. Each Instance ID is corresponding to the different cahnnels. By using “Set/Get Attribute Single” service, user can read/write the parameters of each channel.

Example 1:
Set DO output value.
(Class ID: 0x64, Instance ID: 0x01, Attribute ID 0x01).
If the node ID of the CAN-2057D-32 is 1, and the master (ID: 0x0A) has completed “Explicit” connection with the device. By setting the value of Attribute ID 0x01 to 0xFFFFFFFF, you can set all DO channel to ON.

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Destination MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
0	1	0	0	0	0	0	1	1	0	0	0	8	8A	00	10	64	01	01	FF	FF

Master → **Slave (CAN-2057D-32)**

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Source MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
1	0	0	0	0	0	0	1	0	1	1	0	3	8A	C0	00	--	--	--	--	--

Master ← **Slave (CAN-2057D-32)**

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Destination MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
0	1	0	0	0	0	0	1	1	0	0	0	4	8A	81	FF	FF	--	--	--	--

Master → **Slave (CAN-2057D-32)**

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Source MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
1	0	0	0	0	0	0	1	0	1	1	0	3	8A	C1	00	--	--	--	--	--

Master ◄——————————————— **Slave (CAN-2057D-32)**

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Source MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
1	0	0	0	0	0	0	1	0	1	1	0	2	0A	90	--	--	--	--	--	--

Master ◄——————————————— **Slave (CAN-2057D-32)**

Set the value of Application Object 1, Instance ID 0x01, Attribute ID 0x01 to 0xFFFFFFFF. After sending “Set Attribute Single,” the slave device will respond with 0x90, indicating that the setting was successful. Then DO0 ~ DO31 will be turned on..

Via changing the Attribute ID of the Application Object, user can set other parameters of this device.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Example 2:

Save the settings to EEPROM (Class ID: 0x64, Instance ID: 0x01, Attribute ID: 0x05). If the node ID of the CAN-2057D-32 is 1 and the master station (ID: 0x0A) has already completed an “Explicit” connection with the device, the data can be saved to EEPROM by setting the value of Attribute ID 0x05 to 0x02.

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Destination MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
0	1	0	0	0	0	0	1	1	0	0	0	6	0A	10	64	01	05	02	-	--

Master → **Slave (CAN-2057D-32)**

IDENTIFIER BITS											RTR	Data Length	8-byte Data (byte) (HEX)							
		Source MAC ID																		
10	9	8	7	6	5	4	3	2	1	0			0	1	2	3	4	5	6	7
1	0	0	0	0	0	0	1	0	1	1	0	2	0A	90	--	--	--	--	--	--

Slave (CAN-2057D-32) → **Master**

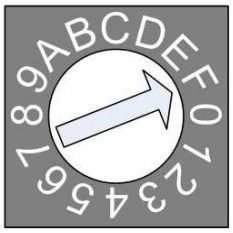
Set the value of Application Object 1, Instance ID 0x01, Attribute ID 0x05 to 0x02. After sending “Set Attribute Single,” the slave device will respond with 0x90, indicating that the setting was successful. Then the data will be saved to EEPROM.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5 Firmware Update

Step 1: Set Module to “Bootloader” mode

Set Module to “Bootloader” mode (set baud rate to 0xF). Then power on the module. After power on, the module’s led (PWR, NET, MOD) will be flashed at the same time. It means that the module have entered into “Bootloader” mode.



Baud Rate Rotary Switch

Step 2: Get Module firmware

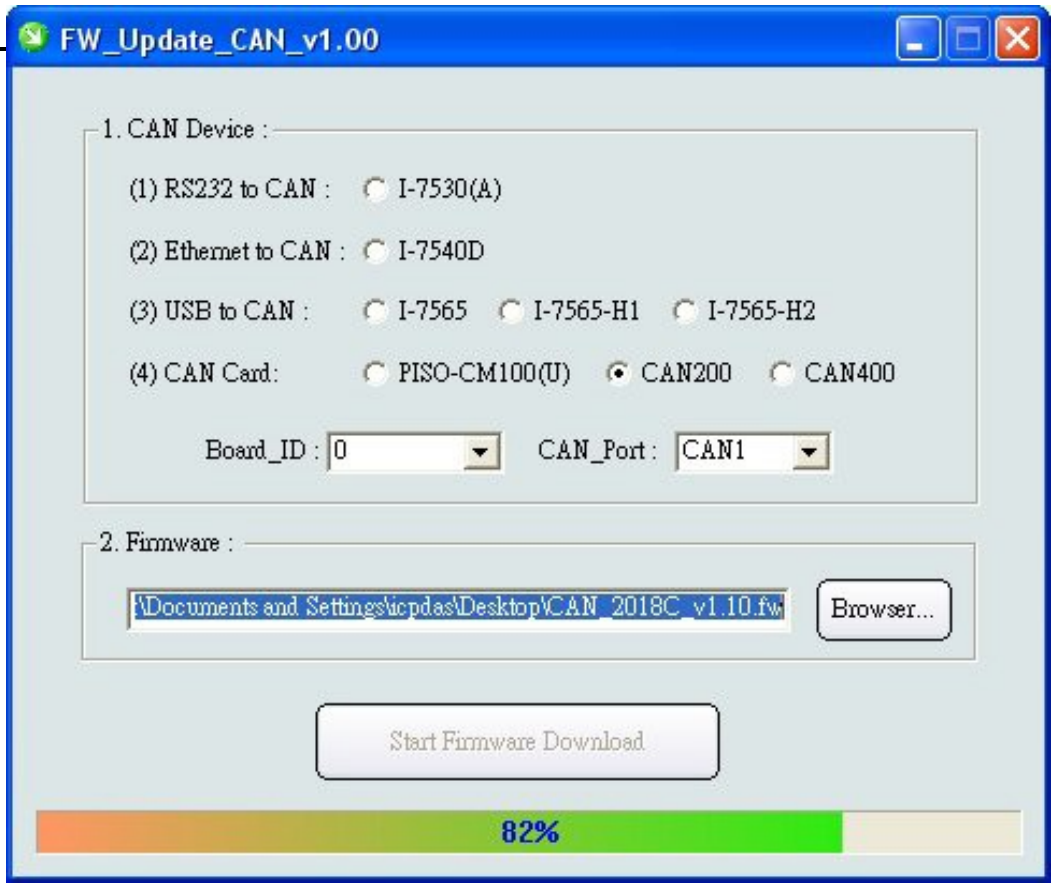
Module firmware can be downloaded from following link:
https://www.icpdas.com/en/product/CAN-2057D-32

Step 3: Run FW_Update_CAN Utility

FW_Update_CAN Utility can be downloaded from following link
https://www.icpdas.com/en/product/CAN-2057D-32

Run FW_Update_CAN Utility

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



[1] CAN Device:

The below ICP DAS CAN products are supported by FW_Update_CAN utility for firmware update.

(1) RS232 to CAN **:** I-7530

(2) Ethernet to CAN **:** I-7540D

(3) USB to CAN **:** I-7565, I-7565-H1, I-7565-H2

(4) CAN Card**:** PISO-CM100(U), PISO-/PCM-/PEX-CAN200 / CAN400

Before firmware update, users need to set the below parameters.

(1) Select CAN hardware interface

(2) Set Dev_Port or Board_ID

(3) Set CAN_Port" number

[2] Download Firmware :

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

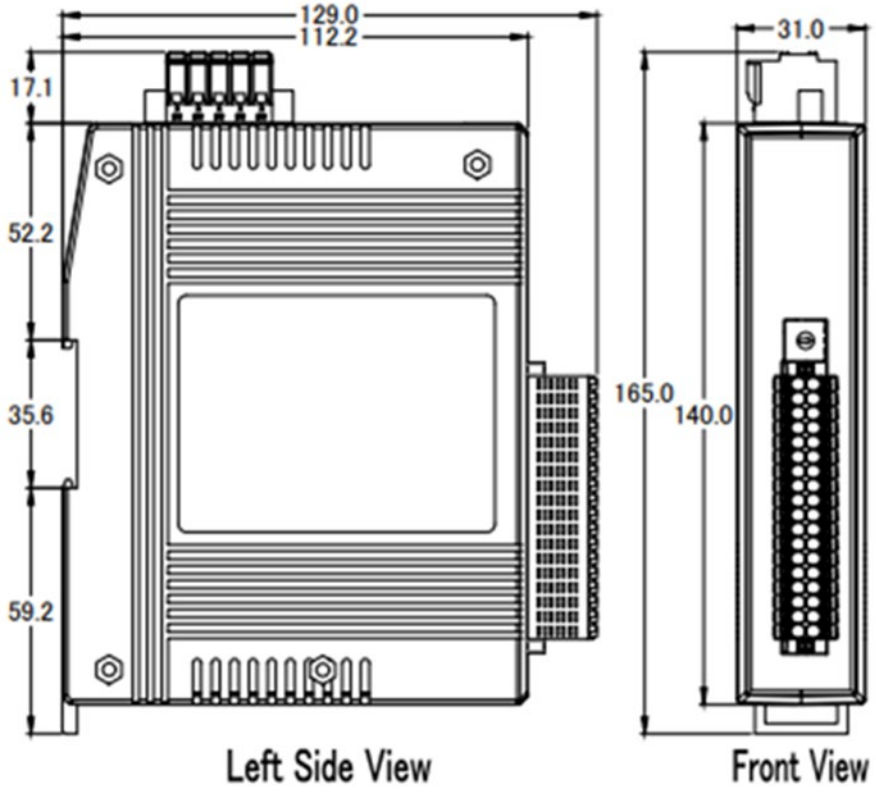
(1) Click “**Browser**…” button to choose firmware file, can_2057d_32_vX.X.fw.

Click “**Start Firmware Update**” button to start firmware update and it will show the total percentage of firmware update in progress bar. After the firmware update finished, it will show the “Firmware Update Success !!” message.



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Appendix A: Dimension



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000