

Connection Procedure of WAGO CANopen 750-337 Bus Coupler and Pro-face AGP-3****-CA1M/LT

Instruction Manual

Version1.1 (2013.11.01)



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Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as error can never be fully excluded, we would appreciate any information or ideas at any time.

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1 Devices in use

This manual refers to the structure using the following devices and equipments.

- WAGO CANopen Bus Coupler 750-337 and the following I/O modules
 - 750-337: CANopen Bus Coupler
 - 750-430: 8-Channel Digital Input Module
 - 750-530: 8-Channel Digital Output Module
 - 750-600: End Module
- Pro-face AGP3400-T1-D24-CA1M
- Pro-face GP-Pro EX version 2.20
- Pro-face USB transfer cable CA3-USBCB-01 (for transfer of screen data)

2 Installation of GP-Pro EX version 3.50

- 1) Insert the GP-Pro EX installation DVD into the PC, and the SET UP MENU window will appear.
- 2) Select "GP-Pro EX", and the Microsoft .NET Framework 2.0 set up window will appear. Follow the Wizard to install Microsoft .NET Framework 2.0.
- 3) The GP-Pro EX 3.50-InstallShield Wizard window will appear. Follow the direction.
 - Enter the Serial Number (11 digits) on the Customer Information window.
 - Enter the Key-Code.
 - Follow the direction of the Wizard to install.

[Note]

When using LT3000 series or LT4000 series, the [Internal I/O] screen appears after the [Device/PLC] screen. Select the [CAN open Driver] on the pull-down menu.

3 Creation of screens/programs

- 1) When you start up GP-Pro EX, the [Welcome to GP-Pro EX] window will appear. Select [New].
- 2) In the [Display Unit] setting screen, set the [Series] to GP-34**Series and the [Model] to AGP-3400T-CA1M.
- 3) In the [Device/PLC] setting screen, click [New Logic] or [New Screen].
- 4) Create screens and/or a logic program.



4 Flow of CANopen setting with the software

4.1 Displaying the I/O Driver setting screen

- 1) Select the [View] menu -> [Work Space] -> [Project Window].
- 2) In the [Project Window] window, click [I/O Driver] in the Peripheral Settings area, and the [I/O Driver] screen will be shown.

[Note]

- When using LT3000 series, click the [External Driver 1] tab.
- When using LT4000 series, click the [Int. Driver 2] tab.

4.2 Importing an EDS file

This section shows the procedure to import an EDS file of a WAGO 750-337 slave.

1) In the [I/O Driver] screen, click [Catalog manager].

| I/O Driver | | Add I/O Driver | Remove I/O Driver |
|-------------------|----------------|--------------------|-------------------|
| Int. Driver 1 | | | |
| | | | <u>1/0 Screen</u> |
| CANopen master | | Baudrate: 250 kbps | Settings |
| Rev.: 10067 | | Node ID: 127 | Catalog manager |
| Assigned slaves | | | |
| ID Product name | Rev. Mandatory | Alias | Key |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



2) Click [Import].

| Cata | alog manager | | | | | | | | | | × |
|------|----------------------|------------|--------|-----------|--------------|-----|---|--------------------|--------|-------|---|
| R | egistered devices | | | | | | [| Device information | | | |
| | Product name | Product ID | Vendor | Vendor ID | Revision No. | Кеу | | Parameter | Value | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | C Deurice executions | | 1111 | | | > | | Catalog operations | | | |
| | | | | | | | | | | | _ |
| | |) Delete | | Rename | Export | | | Import | Export | Close | |
| | | | | | | | | | | | |

3) The [Open] dialog box will appear. Specify the 750-337.EDS file in the save-in location. Click [Open], and the file will be registered into the [Catalog manager].

| Open | | | | | | ? 🔀 |
|------------------------|------------------------|-------------------|---|-----|-------|--------|
| Look jn: | 🚞 CANopen | | ~ | G 🦻 | • 🖽 💙 | |
| My Recent Documents | 750-337.EDS | | | | | |
| Desktop | | | | | | |
| My Documents | | | | | | |
| | | 750.007 | | | | |
| My Computer | Files of <u>t</u> ype: | FDS files (*.eds) | | | ¥ | Cancel |



4) Click [Close].

| Ca | talog manager | | | | | | × |
|----|-----------------------------|------------|---------------------|----------|--------------------|--|----------|
| | Registered devices | | | | Device information | | |
| | Product name | Product ID | Vendor | Vendor I | Parameter | Value | <u>^</u> |
| | WAGO CANopen Buskoppler STD | 151 | WAGO Kontakttechnik | 21 | Catalog key | 760-337 | |
| | | | | | Product name | WAGO CANopen Buskoppler STD | |
| | | | | | Product number | 151 | |
| | | | | | Vendor name | WAGO Kontakttechnik | |
| | | | | | Vendor number | 21 | |
| | | | | | Revision number | 1 | |
| | | | | | Order code | 750-337 | |
| | | | | | Baudrates (Kbps) | 1000, 800, 500, 250, 125, 100, 50, 20, | |
| | | | | | EDS version | 4.0 | |
| | | | | | EDS description | Basic EDS for the CANopen bus cou | |
| | | | | | Created by | Wago | |
| | | | | | Created at | 7/10/2000 3:00 PM | |
| | | | | | Modified by | Wago | |
| | < | | | > | Modified at | 5/23/2007 8:00 AM | ~ |
| | Device operations | | | | Catalog operation | 2 | |
| | Import Delete | B | ename Expo | t | | Export | |

4.3 Adding a slave

- 1) In the [I/O Driver] screen, click [Settings], and the [Network configuration] window will appear.
- Select the item whose Key is 750-337 from the [Registered devices] list and click [Add slave], and "WAGO 750-337" will be added in the [Assigned slaves] list.

| Ne | etwork configuration | | | | | | | |
|-----------|--|-----------------|----------------------------|---------------|------------------|-------------------|-----------------|-------|
| | Master CANopen maste Rev.: 10067 | r | Node ID: 12 Baudrate: 2 | 27 50 kbps | | | Master configur | ation |
| | Assigned slaves | | | | | | | |
| | ID Product name | | Rev. | Mandatory | Alias | Key | | |
| \langle | Add slave Registered devices | Delete slave | | | wice information | | Slave configura | ation |
| | Product name Ver | ndor Re | v. кеу | | arameter | Value | | |
| | WAGU CANopen Busk WA | AGU Kontaktte 1 | 750-33 | | atalog key | 750 337 | | |
| | | | | P | nduct name | WAGO CANonen Bu | iskonnler STD | |
| | | | | P | oduct number | 151 | | |
| | | | | V | endor name | WAGO Kontakttechr | nik | |
| | | | | V | ndor number | 21 | | |
| | | | | R | evision number | 1 | | |
| | < | Ш | | > 0 | rder code | 750-337 | | ~ |
| | | | | | | OK | Can | cel |



4.4 Slave configuration

- Click [Slave configuration].

| Network configuration | | | | | |
|---------------------------------------|--------------|-----------|--------------------|-----------------------------|----------|
| Master | | | | | |
| CANopen master | Node ID: 12 | ?7 | | | |
| Rev.: 10067 | Baudrate: 25 | 50 kbps | | Master configura | ation |
| Assigned slaves | | | | | |
| ID Product name | Rev. | Mandatory | Alias | Key | |
| 1 WAGO CANopen Buskoppler STD | 1 | | | 750-337 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Add slave Delete slave | | | | Slave configura | tion |
| Registered devices | | | | | |
| Product name Vendor Rev. | Key | | Device information | | |
| WAGO CANopen Busk WAGO Kontaktte 1 | 750-337 | , | Parameter | Value | |
| · · · · · · · · · · · · · · · · · · · | | | Catalog key | 750-337 | |
| | | | Product name | WAGO CANopen Buskoppler STD | |
| | | | Product number | 151 | |
| | | | Vendor name | WAGO Kontakttechnik | |
| | | | Vendor number | 21 | |
| | | | Revision number | 1 | |
| | | > | Order code | 750-337 | ~ |
| | | | | OK Cano | el |

- The [Slave configuration] dialog box will appear.



4.4.1 PDO: Mapping input and output

Set PDOs (Process Data Objects), as continuous communication data.

For WAGO 750-337, the standard inputs, which are digital inputs, start from "0x6000" and the standard outputs, which are digital outputs, from 0x6200.

- 1) As an example of inputs, select "Index = 0x6000.1" from the list of the [Available objects from device profile] in the [Parameters] tab.
- 2) If you select "TPDO0" in the [Configured objects], the [Map] button will be enabled.

| Slave configuration | | |
|--|-----------|---|
| Current node WAGO CANopen Buskoppler STD Manufacturer: WAGO Kontakttechnik | | Rev.: 1 Node ID: 1 |
| Parameters Advanced Error Control Advanced Object Configuration Available objects from device profile | | |
| Index Parameter | Data type | Access |
| 0x4302.2E Process Data 44 | Unsigned8 | write-only (rww) |
| 0x4302.2F Process Data 45 | Unsigned8 | write-only (rww) |
| 0x4302.30 Process Data 46 | Unsigned8 | write-only (rww) |
| 0x6000.1 1. digital input block | Unsigned8 | read-only 📃 🚍 |
| 0x6000.2 2. digital input block | Unsigned8 | read-only |
| Configured objects Map Unmap WAGO CANopen Buskoppler STD Input TPD00 TPD01 TPD02 | S | tetting ✓ Enabled Transmission type 255 |
| TPD03 TPD04 TPD05 TPD07 TPD07 TPD08 TPD09 | | Inhibit time (1/10ms) 0 Event timer (ms) 0 Settings |

- 3) Click [Map], and "[0x6000.1] 1.digital input block" will be appended under "TPDO0".
- 4) Set the [Data representation] in the [Setting] area to "Bit".





- 5) As an example of outputs, select "Index = 0x6200.1" from the list of the [Available objects from device profile" on the [Parameters] tab.
- 6) Select "RPDO0" in the [Configured objects] and click [Map], and "[0x6200.1] 1.digital output block" will be appended under "RPDO0".

| Slave configuratio | n | | | | | | | |
|---|---|-----------|-----------------------|--|--|--|--|--|
| Current node WAGO CA Manufacturer: WA | Nopen Buskoppler STD G0 Kontakttechnik | | Rev.: 1 Node ID: 1 | | | | | |
| Parameters Advar Available objects f | nced Error Control Advanced Object Configuration | | | | | | | |
| Index | Parameter | Data type | Access | | | | | |
| 0x6000.3F | 63. digital input block | Unsigned8 | read-only | | | | | |
| 0x6000.40 | 64. digital input block | Unsigned8 | read-only | | | | | |
| 0x6200.1 | 1. digital output block | Unsigned8 | write-only (rww) | | | | | |
| 0x6200.2 | 2. digital output block | Unsigned8 | write-only (rww) 📃 🔤 | | | | | |
| 0x6200.3 | 3. digital output block | Unsigned8 | write-only (rww) | | | | | |
| Configured objects | Index Parameter Data type Access 0x6000.3F 63. digital input block Unsigned8 read-only 0x6000.40 64. digital input block Unsigned8 read-only 0x6200.1 1. digital output block Unsigned8 write-only (rww) 0x6200.2 2. digital output block Unsigned8 write-only (rww) 0x6200.3 3. digital output block Unsigned8 write-only (rww) 0x6200.1 1. digital output block Unmap Setting Configured objects Map Unmap Data representation Image WA60 CANopen Buskoppler STD Image Data representation Image Image Image Object data type Image Image Image Image Image Image Image Image | | | | | | | |
| | | | DK Cancel | | | | | |

Set the [Data representation] in the [Setting] area to "Bit" and click [OK].
 Then click [OK] in the [Network configuration] window, and it will be close and the [I/O Driver] screen will be shown.



4.4.2 Allocating I/O variables to the I/O tree

Allocate I/O variables after the PDO settings (mapping).

- 1) Click [I/O Screen] in the [I/O Driver] screen.
- 2) The [WAGO CANopen Buskoppler STD] tree will be shown. As an example, allocate variables to four lower bits of 8-channel inputs.

Set the variables from "INPUT_00" to "INPUT_03" for the items from "Bit-0" to "Bit-3", which are under "TPDO0". To set a variable, double click the corresponding variable field and enter the variable.

| Name | Variable | IEC Address |
|---|----------|-------------|
| 📮 📗 WAGO CANopen Buskoppler STD @ID:1 | | |
| 🖳 🤤 💿 TPD00 | | |
| 🛛 👘 💋 (0x6000.1) 1. digital input block Bit-0 🤇 | INPUT_00 | ✓ > |
| 📨 💋 [0x6000.1] 1. digital input block Bit-1 | | |
| 🦢 💋 (0x6000.1) 1. digital input block Bit-2 | | |
| 📨 💋 [0x6000.1] 1. digital input block Bit-3 | | |
| 🥙 [0x6000.1] 1. digital input block Bit-4 | | |
| 📟 💋 [0x6000.1] 1. digital input block Bit-5 | | |
| 🧶 🥙 (0x6000.1) 1. digital input block Bit-6 | | |
| 📟 💋 [0x6000.1] 1. digital input block Bit-7 | | |
| | | |
| | | |
| | | |

[MEMO]

* By pointing the cursor on the red marked area and dragging, you can change the column width.



3) In the same way, set the variables from "OUTPUT_00" to "OUTPUT_03" for the items from "Bit-0" to "Bit-3", which are under "RPDO0".

| ···· ⊙ TPD02 | | |
|--|-----------|------------------|
| ─ | | |
| - 📮 📀 RPD00 | | |
| 👘 💋 [0x6200.1] 1. digital output block Bit-0 | OUTPUT_00 | (%QX.1.01.008) |
| 📨 💋 [0x6200.1] 1. digital output block Bit-1 | OUTPUT_01 | (%QX.1.01.009) |
| 🧶 🥙 [0x6200.1] 1. digital output block Bit-2 | OUTPUT_02 | (%QX.1.01.010) |
| 🖤 💋 [0x6200.1] 1. digital output block Bit-3 | OUTPUT_03 | 🗸 (%QX.1.01.011) |
| 🧶 🥙 [0x6200.1] 1. digital output block Bit-4 | | |
| 📟 💋 [0x6200.1] 1. digital output block Bit-5 | | |
| 📟 💋 [0x6200.1] 1. digital output block Bit-6 | | |
| 🧶 🥙 [0x6200.1] 1. digital output block Bit-7 | | |
| | | |
| ○ RPD02 | | |
| 💿 RPD03 | | |
| O RPD02 O RPD03 | | |

4) Click [CANopen Driver] to return to the [I/O Driver] screen.



4.5 Master configuration

- In the [I/O Driver] screen, click [Settings].

4.5.1 Setting a baud rate

In the Master configuration, you can make a baud rate settings.

Baud rate settings on a slave unit can be made with the DIP switches on it.

1) In the [Network configuration] window, click [Master configuration].

| Network configuration | | | | | | |
|------------------------------------|-------------|-----------|-------------------|---------------------|----------------------|----------|
| Master | | | | | | |
| CANopen master | Node ID: 12 | 27 | | | | |
| Rev.: 10067 | Baudrate: 2 | 50 kbps | | | laster configuration | on |
| Assigned slaves | | | | | | \leq |
| ID Product name | Rev. | Mandatory | Alias | Key | | |
| 1 WAGO CANopen Buskoppler STD | 1 | | | 750-337 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | _ | | |
| Add slave Delete slave | | | | 9 | Slave configuratio | on 📄 |
| Begistered devices | | | | | | |
| Product name Vendor Rev | . Kev | [| evice information | 1 | | |
| WAGO CANopen Busk WAGO Kontaktte 1 | 750-337 | 7 | Parameter | Value | | <u>^</u> |
| | | | Catalog key | 750-337 | | |
| | | | Product name | WAGO CANopen Buskop | opler STD | |
| | | | Product number | 151 | | |
| | | • | /endor name | WAGO Kontakttechnik | | |
| | | | /endor number | 21 | | |
| | | | Revision number | 1 | | |
| | | | Order code | 750-337 | | |
| | | | 0,000 | 100-001 | | |
| | | | | ОК | Cancel | |



2) In the [Master configuration] dialog box, specify the [Baud rate].

| anufacturer: Digital Electronics | Node ID: 127 |
|---|---|
| twork settings Error Control Overview Advance | d Object Configuration |
| Network-wide configuration | On Error Control Event of a mandatory slave |
| Baud rate 125 kbps | Stop all nodes |
| | Reset all nodes |
| Global SYNC period (ms) | • Treat the slave individually |
| Global heartbeat timing (ms) 200 Change | |
| NMT inhibit time (1/10ms) 50 | |

[Note]

When LT4000 series is used, the baud rate cannot be set to 500kbps and 1000kbps.



5 Relation between objects and I/O module

The relation between objects and I/O modules is as follows. Please refer to the Modular I/O System CANopen 750-337 Manual for the details. The values in parentheses are ones in the manufacturer area; for example, 0x6000 and 0x2000 are the same value.

| 0x6000 | Digital input | (0x2000) | 0x6200 | Digital output | (0x2100) |
|--------|---------------|----------|--------|----------------|----------|
| 0x6401 | Analog input | (0x2400) | 0x6411 | Analog output | (0x2500) |

e.g.)



* Object

Data areas of objects are identified as follows.Commutation area0x1000 to 0x1FFFFManufacturer area0x2000 to 0x5FFFProfile area0x6000 to 0x9FFF

* NOTE

- As for the transmission of analog input data, CAN messages can be sent even when tiny variations of values are found. This may cause an overflow. To avoid this, the transmission of analog input data via PDOs is deactivated by default. This communication load can be inhibited by the "inhibit time" of the slave settings. Please refer to 5.2.1 Parameters (POD settings) for the details. For the transmission of analog input/output data using the object 0x6401 or 0x6411, set the object 0x6423, Analog Input Global Interrupt Enable, which is to control the transmission of analog input data using PDOs, to 1.
- For the transmission of analog input/output data using the object 0x2400 or 0x2500, the above setting is not necessary. The objects 0x2000s to 0x5000s are in the manufacture area and they do not depend on the above setting.

Index 0x6423: Analog Input Global Interrupt Enable Sub Index0: = $\begin{bmatrix} 1 \end{bmatrix}$ The default value is set to "0".



Details of settings with the software

5.1 Catalog manager

5.1.1 Device operations

| Catalog manager | | | | | × | | |
|--------------------|-----------------------------|------------|---------------------|----------|--------------------|--|--|
| Registered devices | | | Device information | | | | |
| | Product name | Product ID | Vendor | Vendor I | Parameter | Value | |
| | WAGO CANopen Buskoppler STD | 151 | WAGO Kontakttechnik | 21 | Catalog key | 760-337 | |
| | | | | | Product name | WAGO CANopen Buskoppler STD | |
| | | | | | Product number | 151 | |
| | | | | | Vendor name | WAGO Kontakttechnik | |
| | | | | | Vendor number | 21 | |
| | | | | | Revision number | 1 | |
| | | | | | Order code | 760-337 | |
| | | | | | Baudrates (Kbps) | 1000, 800, 500, 250, 125, 100, 50, 20, | |
| | | | | | EDS version | 4.0 | |
| | | | | | EDS description | Basic EDS for the CANopen bus cou | |
| | | | | | Created by | Wago | |
| | | | | | Created at | 7/10/2000 3:00 PM | |
| | | | | | Modified by | Wago | |
| | < | | | > | Modified at | 5/23/2007 8:00 AM | |
| | Device operations | | | | Catalog operations | | |
| | Import Delete | R | ename Expor | | Import | Export Close | |

* Import

Imports an EDS (Electronic Data Sheet) file.

The EDS file is registered in the Catalog manager of GP-Pro EX, and the contents in the EDS file is shown in the Catalog manager.

* Delete

Deletes a designated device from the catalog in GP-Pro EX.

* Rename

Allows you to rename the key of a device registered in the catalog.

The name of the key when importing an EDS file is the EDS file name without the extension.

Up to 256 characters

* Export

Exports contents in a device registered in the catalog as an EDS file.



5.1.2 Catalog operations

| Product name | Product ID | Vendor | Vendor I | Parameter | Value |
|--------------------------------|------------|----------------------|----------|--------------------|--|
| (AGO CAMeson Ruskespler STD | 151 | VCAGO Kontokttoohnik | 21 | Catalog key | 750 337 |
| VAGO CANOperi Buskoppier 5 r.D | 101 | WAGO KUNIAKIJECHNIK | 21 | Product name | WAGO CANopen Buskoppler STD |
| | | | | Product number | 154 |
| | | | | Product number | |
| | | | | vendor name | WAGO Kontakttechnik |
| | | | | Vendor number | 21 |
| | | | | Revision number | 1 |
| | | | | Order code | 760-337 |
| | | | | Baudrates (Kbps) | 1000, 800, 500, 250, 125, 100, 50, 20, |
| | | | | EDS version | 4.0 |
| | | | | EDS description | Basic EDS for the CANopen bus cou |
| | | | | Created by | Wago |
| | | | | Created at | 7/10/2000 3:00 PM |
| | | | | Modified by | Wago |
| Ш. | | | > | Modified at | 5/23/2007 8:00 AM |
| Device operations | | | | Catalog operations | |
| | | | | | |

* Export

Exports registered devices into one file (a catalog file; .cat).

By doing so, it will be easier to make the same environment in another PC.

| Export catalog |
|--|
| |
| Export all the registered devices. |
| O Export only the devices in use. |
| Export only the selected devices. |
| OK Cancel |

* Import

Imports a catalog file.



5.2 Slave configuration

5.2.1 Parameters (PDO settings)

Up to 8 bytes (64 bits) of data can be assigned per PDO.

The transmission type can be set by each PDO.

- In the [Network configuration] window, click [Slave configuration]. In the [Slave configuration] dialog box, select "TPDO0" in the [Configured objects] and click [Settings].



The [TPDO configuration] dialog box will appear.

| TPDO configuration | |
|---|---------------------------------|
| PD0 Communication Parameter | |
| Transmission types | Resulting PDO transmission type |
| Acyclic synchronous | 255 |
| Cyclic synchronous | |
| Asynchronous event | Event timer (ms) |
| Asynchronous event | Inhibit time (1/10 ms) |
| (depending on Device profile) | 0 |
| | OK Cancel |

* Asynchronous event

A PDO is received immediately when an event occurs regardless of the SYNC signal.

For 254, this is defined by the manufacturer.

For 255, this is defined in the device profile.

* Acyclic synchronous / Cyclic synchronous

A PDO is sent synchronizing in synchronization with the SYNC signal flowing into the network.

For the cyclic synchronous, whose SYNC cycle rate can be set from 1 to 240, when 1 is set, a PDO is sent for every SYNC object.

When 3 is set, a PDO is sent each time that three SYNC signals flow into the network.



* Event timer, Inhibit time

The Event timer and the Inhibit time can be set when the transmission type is set to Asynchronous event. The Event timer is the setting to send data consistently besides to send it when it changes.

The Inhibit time is the setting to inhibit increase of communication load by continuous data change.

* Identity settings

The master unit makes matching check between the device information (the contents of the imported EDS file) and the actual slave unit when communication starts.

Items to be checked are follows.

Device type Vendor ID

Product code

Revision number

[NOTE]

Check off the [Revision number] when connecting with 750-337.



When connecting with WAGO 750-337, the Device type cannot be selected.

The imported EDS file identifies if each item is enabled or disabled.



* Restore

Set for the master unit whether or not to restore, or write, the parameters of slave units on occasions such as when a communication cable is disconnected and the system is recovered.

If you select "No restore", the slave units can operate retaining the outputting signals.

| Configured objects Map Unmap | |
|---|-----------------|
| 😑 WAGO CANopen Buskoppler STD | Setting |
| 🚊 Input | |
| 🖨 TPDOO | |
| [0x6000.1] 1. digital input block (BITx8) | 0x 0 🗘 0 |
| TPD01 | Vender ID |
| - TPDO2 | Vendor ID |
| ···· TPD03 | Product code |
| TPDO4 | |
| TPD05 | |
| TPDO6 | Restore |
| TPD07 | Restore All 🗸 🗸 |
| TPD08 | |

Select from the following 3 for the parameter restoration.

- No restore: Parameters are not restored.
- Restore All (default): All parameters are restored.
- Man. 4: restore manufacturer defined default parameters For WAGO 750-337, "Only Comm" and "Only App" are not supported.

* NOTE

- Even if you set the object 0x6206, Error Mode Output 8-Bit, which is to retain the transmission of output data, it is set off once when recovering from a communication error.



5.2.2 Advanced error control

* HeartBeat

Each node (the master and slaves) sends heartbeat messages.

By monitoring (receiving) heartbeat messages, the master can check each node is active.

The producer is the one that sends messages, and the consumer is the one that receives the messages.

Currently, not NodeGuard but HeartBeat is recommended to use.

In the [Network configuration] window, click [Slave configuration] to set the heartbeat in the [Advanced Error Control] tab.

| Parameters Advanced Error Control Advanced Object Configuration | | | | | | |
|---|--|-------|----|-------------------------|--|--|
| | Select Error Control Protocol Use HeartBeat Use NodeGuard | | | | | |
| | Producer heartbeat time (ms) | 200 | \$ | | | |
| ID | Product name | Alias | | Consumer heartbeat (ms) | | |
| 127 | CANopen master | | | 300 | | |

[Remark]

The heartbeat can be set in the Master configuration dialog box ordinarily. Set the [Global heartbeat timing] on the [Network settings] tab and click [Change] to apply the setting to all slaves.

| Master configuration | |
|---|--|
| Current node | |
| CANopen master | Rev.: 10067 |
| Manufacturer: Digital Electronics | Node ID: 127 |
| | |
| Network settings Error Control Overview Advanced Ot | sject Configuration |
| Network-wide configuration | On Error Control Event of a mandatory slave |
| Baud rate | |
| 250 kbps 🗸 | Stop all nodes |
| | Reset all nodes |
| Global SYNC period (ms) | Treat the slave individually |
| Biobal heartbeat timing (ms) 200 Image Change | |
| NMT inhibit time (1/10ms) 50 | |
| | OK Cancel |



* NodeGuard

The master unit monitors slaves by polling (guarding) for the time of the Guard time multiplied by the Life time factor.

| Parameters Advance | d Error Control Advanced Object Cont | iguration | |
|--------------------|--------------------------------------|-----------------|--|
| | Select Error Control Protocol | 💿 Use NodeGuard | |
| | | | |
| | | | |
| | | | |
| | Guard time (ms) | 200 | |
| | Life time factor | 2 | |
| | | | |

5.2.3 Advanced object configuration

The Advanced Object Configuration tab shows the object list of the slave unit. The contents of objects vary depending on the type of the slave unit.

| e configuration | | | | | | |
|---|-----------|----------------------|------------|---------|------------|-------------|
| WAGO CANopen Buskoppler STD Rev.: 1 | | | | | | |
| Manufacturer: WAlaU Kontakttechnik Node ID: 1 arameters Advanced Error Control Advanced Object Configuration Object search Object Type Filter Mappable IV ReadOnly | | | | | | |
| Search Imappable Imappabl | | | | | | |
| Set | Index 🔺 | Parameter | Value | Default | Data type | Access |
| No | 0x1000.00 | device type | 0x00000000 | | Unsigned32 | read-only |
| No | 0x1001.00 | error register | 0 | | Unsigned8 | read-only |
| No | 0x1003.00 | number of errors | 0 | 0x00 | Unsigned8 | read-only |
| No | 0x1003.01 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.02 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.03 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.04 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.05 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.06 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.07 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.08 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| No | 0x1003.09 | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only |
| | 0x1003.0A | standard error field | 0x00000000 | 0x00 | Unsigned32 | read-only 🤍 |



5.3 Master configuration

5.3.1 Network settings

| Master configuration | |
|---|---|
| Current node CANopen master | Bev : 10067 |
| Manufacturer: Digital Electronics | Node ID: 127 |
| Network settings Error Control Overview Advanced Object | at Configuration |
| Network-wide configuration | On Error Control Event of a mandatory slave |
| Baud rate 250 kbps | Stop all nodes |
| | Reset all nodes |
| Global SYNC period (ms) | |
| Global heartbeat timing (ms) 200 Change | |
| NMT inhibit time (1/10ms) | |
| | OK Cancel |

* Baud rate

Select the baud rate of the master unit.

50kbps to 1000kbps (default: 250kbps)

[Note]

When LT4000 series is used, the baud rate cannot be set to 500kbps and 1000kbps.

* Global SYNC period

Set the send cycle time of SYNC messages.

0 (disabled), 3 to 32767ms (default: 50ms)

[Note]

When using LT4000 series, select [Enabled] or not for sending SYNC messages. When [Enabled] is selected for SYNC transmission, the SYNC messages are sent at the cycle time synchronizing with the scan time of the logic program.



* Global heartbeat timing

To check, or monitor, whether the slave unit is active or not, use the heartbeat or the node guarding. 50 to 21844ms (default: 200ms)

* NMT inhibit time

This is the setting to inhibit the master unit to send NMT messages continuously. NMT stands for "Network Management". 0 to 3276.7ms (default: 5ms)

* On Error Control Event of a mandatory slave

Select from the following 3.

- Stop all nodes
- Reset all nodes
- Treat the slave individually (default)

For WAGO 750-337, use the default because DS302 is not supported.

If you select [Treat the slave individually], each slave unit sends the reset signal, not the master unit sends the reset signal by broadcast.

5.3.2 Error control overview

The Error Control Overview tab allows you to check the list of the node monitor (Heartbeat / Node guard).

| Network settings Error Control Overview Advanced Object Configuration | | | | | | | | | | |
|---|--------------------|-------|---------------|---------------|------------------|--|--|--|--|--|
| Producer heatbeat time (ms) 200 | | | | | | | | | | |
| | | | | | | | | | | |
| ID | Product name | Alias | Cons. HB (ms) | Guard t. (ms) | Life time factor | | | | | |
| 1 | WAGO CANopen Busko | | 300 | | | | | | | |

5.3.3 Advanced object configuration

The Advanced Object Configuration tab shows the list of objects of the master unit.

| Network set | Vetwork settings Error Control Overview Advanced Object Configuration | | | | | | | | | |
|-------------|--|----------------------|------------|----------|------------|------------|---|--|--|--|
| Object s | Object search Search Search Mappable Not mappable ReadWrite WriteOnly Profile area | | | | | | | | | |
| Set | Index 🔺 | Parameter | Value | Default | Data type | Access | ^ | | | |
| No | 0x1000.00 | Device Type | 0x00000195 | 0x000001 | Unsigned32 | read-only | | | | |
| No | 0x1001.00 | Error Register | 0 | | Unsigned8 | read-only | | | | |
| No | 0x1003.00 | number of elements | 0 0 | | Unsigned8 | read-write | | | | |
| No | 0x1003.01 standard err | | 0x00000000 | | Unsigned32 | read-only | | | | |
| No | 0x1003.02 | standard error field | 0x00000000 | | Unsigned32 | read-only | | | | |
| Yes | 0x1005.00 | COB-ID SYNC mes | 0x40000080 | 0x800000 | Unsigned32 | read-write | | | | |
| Yes | 0x1006.00 | Communication Cyc | 50000 | 0 | Unsigned32 | read-write | | | | |



6 PDO protocol, SDO protocol

6.1 PDO (Process Data Object) protocol

The PDO protocol is used for communicating data such as digital inputs and outputs continuously.

6.2 SDO (Service Data Object) protocol

The SDO protocol is used for communicating data not necessary to be sent continuously, such as infrequent changes of setting values.

Data assigned to SDOs are communicated by the SDO instructions (SDOR, SDOW) of the logic program.



7 I/O driver instructions

7.1 SDOR, SDOW

Reads from / writes to objects of the slave unit.

SDOR (SDO Read)

- S1: index number of the object
- S2: sub index number of the object
- S3: node ID
- S4: length (byte number) of the object access
- S5: location to store read data (offset number of #L_IOMasterDrv[])
- D1: error code



| 💑 [CAN]SDOR | |
|-------------|-----------------------|
| S1 | D1 |
| Index 💌 | ErrorCode |
| S2 | |
| SubIndex | |
| S3 | |
| NodelD | |
| S4 | |
| Length 🔽 | |
| S5 | |
| Offset 🔽 | |
| | OK (<u>D)</u> Cancel |



SDOW (SDO Write)

- S1: index number of the object
- S2: sub index number of the object
- S3: node ID
- S4: length (byte number) of the object access
- S5: location to store data to be written (offset number of #L_IOMasterDrv[])
- D1: error code



| 💰 [CAN]SDOW | |
|-------------|---------------|
| S1 | D1 |
| Index 🔽 | ErrorCode 💌 |
| S2 | |
| SubIndex 🗸 | |
| S3 | |
| NodelD 🗸 | |
| S4 | |
| Length 💌 | |
| S5 | |
| Offset 💌 | |
| | OK (D) Cancel |



7.2 DGMT, DGSL

Reads the status of the master unit / slave unit.

DGMT (Diagnostic Master)

- D1: status information
- D2: event information



DGSL (Diagnostic Slave)

- S1: node ID
- D1: slave diagnostic information



8 Transferring I/O firmware

Firmware for the CANopen board is not yet installed in CANopen units for AGP-3****-CA1M/LT by factory default. The firmware is transferred and written when the first screen data transfer. This I/O firmware is written when the unit is restarted after transferring the project file.



9 AGP-3****-CA1M/LT unit

9.1 Offline menu



* Master Diagnostics, Master Configuration & Events

These menus have the same contents as the DGMT instruction does, which is one of the I/O driver instructions.

The Master Diagnostics screen includes status information and the Master Configuration & Events screen includes event information.









* Slave Diagnostics

This menu has the same contents as the DGSL instruction does, which is one of the I/O driver instructions.

You can select the status of the slaves and check nodes in the list.



| Master Diag | | | Sla | ive D | liag. | Ma | ster | Con | f 🌩 |
|-------------|-------|-----|-----|-------|-------|-------|------|-------|-------|
| Slav | /e Di | ag. | | Ass | igne | d sl | aves | 5 | • |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | | | | | | | |
| (| | | | | | | | | |
| Ex | it l | Ba | ck | ľ. | | 1 07/ | 09/1 | IN 15 | 5:28 |



10 Installation of WAGO 750-337

10.1 Hardware structure



Hardware is consist of the Bus Coupler 750-337, I/O modules Series 750 (up to 63 modules), and the End Module 750-600.

DIs, DOs, AIs, and AOs can be mixed. Select necessary modules. A DC 24V power supply is required. Please refer to the Modular I/O System Design Notes for the details.

http://www.wago.com/wagoweb/documentation/750/eng_manu/m01xxphe.pdf



Diagram



WAGO 750-337



* NOTE

- To minimize the signal's reflections from the end of the cable, a line termination shall be placed close to the 2ends of the bus. Connect both ends of the twisted pair cable (CAN_H and CAN_L) to each LT. Use line terminationwhose resistance value is 120Ω . (5%, 1/4 W maximum).

10.2 Connector diagram

| | | Pin No. | Signal Name | Description |
|-----|-------------|---------|----------------|-------------------|
| Q | Constant of | 1 | CAN_V+ | Not used |
| 8 | CAN_High | 2 CAN_H | | CAN signal high |
| ð | CAN_Low | 3 | Drain (Shield) | Shield connection |
| 101 | 4 5 | 4 | CAN_L | CAN signal low |
| | | 5 | GND | Ground |



10.3 Display elements

The operating condition of the bus coupler or node is signaled via LEDs.



| LED | Color | Description |
|----------|-----------|---|
| STOP | Red | The bus coupler / node is in the state STOP. |
| RUN | Green | The bus coupler / node is in the state OPERATIONAL. |
| Tx- | Red | CAN transmitter buffer is full. |
| Overflow | | |
| Rx- | Red | CAN receiver buffer is full. |
| Overflow | | |
| 10 | Red/green | The "I/O" LED indicates the operation of the node and signals |
| | /orange | faults encountered. |
| А | Green | Status of the operating voltage system |
| B or C | Green | Status of the operating voltage - power jumper contacts |
| | | (LED position is manufacturing dependent) |

10.4 Hardware address (Module ID)



The DIP switch is used both for setting the baud rate of the bus coupler and for setting the module ID.

This module ID is necessary for calculating the COB IDs.

The binary significance of the individual DIP switches increases according to the switch number, i.e. the module ID 1 is set by DIP1 = ON, the module ID 8 by DIP4 = ON. The nodes of the WAGO-I/O-SYSTEM can have module IDs from 1 to 127.



10.5 Setting the baud rate

This bus coupler supports 9 different baud rates. DIP switches are used to set the baud rate.

The bus coupler changes to the configuration mode using the set module ID = 0 (all DIP switches off) with subsequent power on. The current set baud rate is displayed in this status (starting from Firmware WT). The baud rate display is shown by the top LED group (STOP, RUN, Tx-, Rx-Overflow), whereby STOP = Switch1, RUN = Switch2, Tx-Overflow = Switch3, Rx-Overflow = Switch4. The current set baud rate is displayed by the corresponding LEDs blinking slowly. Now the new baud rate can be set using the DIP switch, by turning the corresponding DIP switches to "ON".

The set configuration is saved by turning DIP8 to "ON". Following saving, the new baud rate is displayed by the corresponding LEDs having a steady light. Except for the baud rate of 1M baud, this is displayed by all 4 LEDs blinking/ being lit.

| DIP | Function | 1M | 800 | 500 | 250 | 125 | 100 | 50 | 20 | 10 | Displayed |
|--------|------------|---|-----|-----|-----|-----|-----|----|----|----|-----------|
| | | bit | kВ | kВ | kВ | kВ | kВ | kB | kВ | kB | by LED |
| 1(LSB) | Baud rate | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | STOP |
| 2 | Baud rate | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | RUN |
| 3 | Baud rate | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | Tx- |
| | | | | | | | | | | | Overflow |
| 4(MSB) | Baud rate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Rx- |
| | | | | | | | | | | | Overflow |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | Acceptance | ance "off" -> "on" : Accepting the configuration settings | | | | | | | | | |

In this status, no data exchange via CAN is possible.

Once the baud rate setting / baud rate check is completed, switch off the operating voltage knowing that only the DIP value will be used to calculate the IDs which has been set during power ON. When switched off, the desired module ID can be set on the DIP.

For more information on WAGO 750-337, visit WAGO's website.

http://www.wago.com/wagoweb/documentation/index_e.htm

