# WAGO-I/O-SYSTEM

## Connection Procedure of WAGO CANopen 750-337 Bus Coupler and Pro-face display units supporting CANopen master

## **Instruction Manual**

Version 1.2 (2017.09.15)



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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.

We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally trademark or patent protected.

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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 4.07.200
- Pro-face USB transfer cable CA3-USBCB-01 (for transfer of screen data)

#### 2 Installation of GP-Pro EX version 4.07.200

- 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 4.07.200-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.

#### **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.

[Note]

When using LT3000 series, LT4000 series, SP5000 series Power Box, the [Internal I/O] screen appears after the [Device/PLC] screen. Select the [CAN open Driver] on the pull-down menu.



## 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 and SP5000 series Power Box, 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].

Catalog m	anager					
Registere	d devices			Device information		
Product	name Product ID	Vendor   Vendor ID	)   Revision No.   Key	Parameter	Value	
< Device				Catalan anatian		
	operations			Catalog operations-		
	mport Dela	ete 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	ø	Þ	•	
My Recent Documents	750-337.ED5							
Desktop								
My Documents								
		750.007					1	
My Computer	File <u>n</u> ame: Files of <u>t</u> ype:	750-337 EDS files (*.eds)				~	]	<u>O</u> pen Cancel



#### 4) Click [Close].

Catalog ma	inager						×
Registered	l devices				Device information		
Product	name	Product ID	Vendor	Vendor I	Parameter	Value	<u>^</u>
WAGO C	ANopen 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	\$	
Ir	nport 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.

Network configuration					
Master			1		
CANopen master	Node ID: 127				
Rev.: 10067	Baudrate: 250	kbps		Master configu	ration
Assigned slaves					
ID Product name	Rev. M	landatory	Alias	Key	
Add slave Delete slave				Slave configur	ation
Registered devices					
Product name Vendor Rev.	Key	Dev	vice information		
WAGO CANopen Busk WAGO Kontaktte 1	750-337	Pa	rameter	Value	
		Cat	alog key	750-337	
		Pro	duct name	WAGO CANopen Buskoppler STD	=
		Pro	duct number	151	
		Ver	ndor name	WAGO Kontakttechnik	
		Ver	ndor number	21	
		Rev	ision number	1	
		Orc	ler code	750-337	<b>~</b>
				OK Can	icel
					.::



## 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	<b>~</b>
				OK Cano	el

- The [Slave configuration] dialog box will appear.



#### 4.4.1 PDO: Mapping input and output

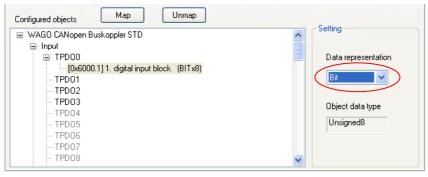
Set PDOs (Process Data Objects), as continuous communication data.

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 configuratio	n		
	Nopen Buskoppler STD G0 Kontakttechnik		Rev.: 1 Node ID: 1
Parameters Adva Available objects	nced Error Control Advanced Object Configuration		
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 object	pen Buskoppler STD 10 11 12 13 14 15 16 16 17	S.	etting ✓ Enabled Transmission type 255 Inhibit time (1/10ms) 0 Event timer (ms) 0
	9		OK Cancel

- 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)
i∎⊷ Input i≣⊷ Output i≣⊷ RPDO	pen Buskoppler STD 0 x6200.1] 1. digital output block (BYTEx1) 1 2 3 4 5 6		ting Data representation Byte
			DK Cancel

7) 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).

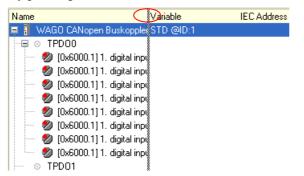
- 1) Click [I/O Screen] in the [I/O Driver] screen.
- 2) The [WAGO CANopen Buskoppler STD] tree will be shown. As an example, allocate variables to four lower bits of 8-channel inputs.

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		
○ TPD02		
⊘ TPDO3		

#### [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".

⊨ ⊙ 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		
⊙ RPD01		
── ⊗ RPD02		
💿 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			ſ			
CANopen master	Node ID: 12	27				
Rev.: 10067	Baudrate: 2	50 kbps			Master configurati	on
Assigned slaves						_
ID Product name	Rev.	Mandatory	Alias	Key		
1 WAGO CANopen Buskoppler STD	1			750-337		
Add slave Delete slave					Slave configuration	on
Registered devices				_		
Product name Vendor Rev	/. Key	De	vice information	7		
WAGO CANopen Busk WAGO Kontaktte 1	750-337	7 P	arameter	Value		<u>^</u>
		G	italog key	750-337		
		Pt	oduct name	WAGO CANopen Busko	ppler STD	
		Pr	oduct number	151		
		Ve	ndor name	WAGO Kontakttechnik		
		Ve	ndor number	21		
		R	vision number	1		
<		> 0	der code	750-337		~
				1		
				OK	Cancel	



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

ANopen master anufacturer: Digital Electronics	Node ID: 127
twork settings Error Control Overview Advar	aced Object Configuration
Network-wide configuration Baud rate	On Error Control Event of a mandatory slave
125 kbps	Stop all nodes
	Reset all nodes
Global SYNC period (ms)	<ul> <li>Treat the slave individually</li> </ul>
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.

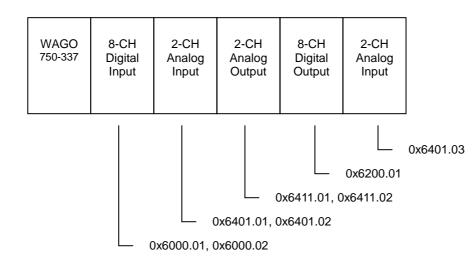


#### 5 Relation between objects and I/O module

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
VAGO CANopen Buskoppler STD		WAGO Kontakttechnik		Catalog key	750-337
WAGO CANOPER BUSKOPPIELS I D	101	WAGO KUNIAKIJECHNIK	21	Product name	WAGO CANopen Buskoppler STD
				Product number	151
					WAGO Kontakttechnik
				Vendor name	
				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
<b>.</b>			>	Modified at	5/23/2007 8:00 AM
Device operations				Catalog operations	
Import Delete		ename Expo		Import	Export Close

#### \* 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
<ul> <li>Export all the registered devices.</li> </ul>
O Export only the devices in use.
Export only the selected devices.
OK Cancel

\* Import

Imports a catalog file.



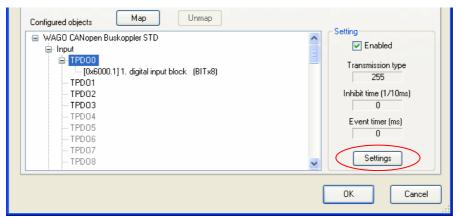
#### 5.2 Slave configuration

#### 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
<ul> <li>Acyclic synchronous</li> </ul>	255 SYNC cycle rate
Cyclic synchronous	
<ul> <li>Asynchronous event</li> </ul>	Event timer (ms)
<ul> <li>Asynchronous event</li> </ul>	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	
🖨 TPDO0	Device type
[0x6000.1] 1. digital input block (BITx8)	0x 0 🍣 0
···· TPD01	Vendor ID
TPD02	
···· TPD03	Product code
TPDO4	Revision number
TPD05	
TPD06	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 F	eGuard					
	Producer heartbeat time (ms)	200	\$				
ID	D Product name			Consumer heartbeat (ms)			
127	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	pject 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)	<ul> <li>Treat the slave individually</li> </ul>
Etobal heartbeat timing (ms) 200 📚 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 Advanced B	Fror Control Advanced Object Cor	nfiguration	
ſ	Select Error Control Protocol		
	🔘 Use HeartBeat	💿 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.

	CANoper	n Buskoppler ttechnik	STD			ev.: 1 ode ID: 1	
'aramete	rs Advanced Error C et search Search Reset the object	Control Advanced Ob Object Type Fil Mappable	ter ole V	on ReadOnly ReadWrite WriteOnly		inication area acturer area area	
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	1
No	0x1003.00	number of errors	0	0x00	Unsigned8	read-only	1
No	0x1003.01	standard error field	0x00000000	0x00	Unsigned32	read-only	1
No	0x1003.02	standard error field	0x00000000	0x00	Unsigned32	read-only	
No	0x1003.03	standard error field	0x00000000	0x00	Unsigned32	read-only	1
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	
No 0x1003.0A standard error field 0x0000000 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).

1	Network settings Error Control Overview Advanced Object Configuration									
Producer heatbeat time (ms) 200										
١,										
ID Product name Alias Cons. HB (ms) Guard t. (ms) Life time fa										
	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.

letwork settings Error Control Overview Advanced Object Configuration											
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 error field	0x00000000		Unsigned32	read-only					
No 0x1003.02		standard error field	0x00000000		Unsigned32	read-only					
Yes 0x1005.00 0		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.



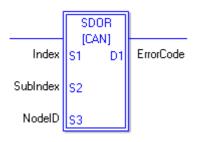
## 7 I/O driver instructions

## 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

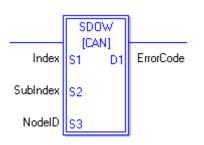


💑 [CAN]SDOR	
S1	D1
Index 💌	ErrorCode 💌
S2	
SubIndex 💌	
S3	
NodelD	
S4	
Length 🔽	
S5	
Offset 🗸 🗸	
	OK ( <u>D)</u> Cancel



## 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

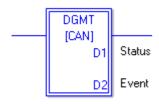


#### 7.2 DGMT, DGSL

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

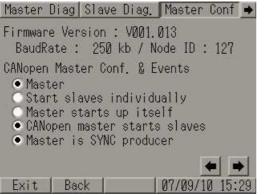


\* Master Diagnostics, Master Configuration & Events

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.





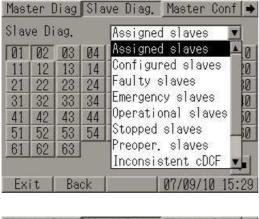




\* Slave Diagnostics

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.

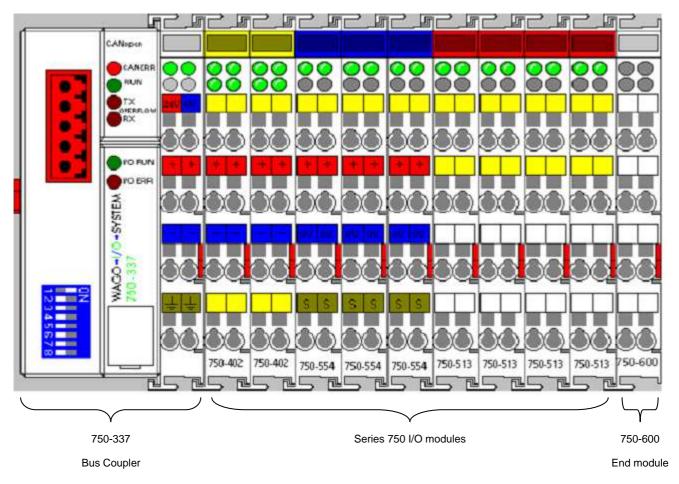


Mast	ter [	)iag	Sla	ve D	liag.	Ma	ster	Con	f 🔿		
Slav	/e Di	ag.		Ass	igne	d sl	d slaves 💌				
01	02	03	04	05	06	07	08	09	10		
11	12	13	14	15	16	17	18	19	20		
21	22	23	24	25	26	27	28	29	30		
31	32	33	34	35	36	37	38	39	40		
41	42	43	44	45	46	47	48	49	50		
51	52	53	54	55	56	57	58	59	60		
61	62	63									
Ex	it	Ba	ck	Ľ		07/	09/1	0 15	5:28		



## 10 Installation of WAGO 750-337

## 10.1 Hardware structure



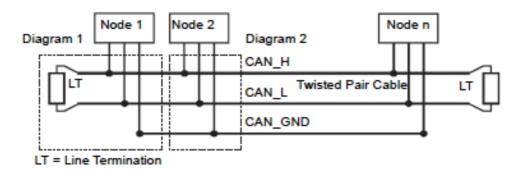
Hardware is consist of the Bus Coupler 750-337, I/O modules Series 750 (up to 63 modules), and the End Module 750-600.

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.

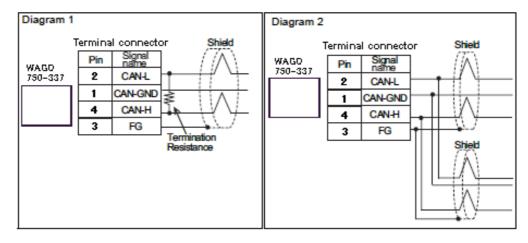
http://www.wago.com/wagoweb/documentation/750/eng\_manu/m01xxphe.pdf



#### 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  $120 \Omega$ . (5%, 1/4 W maximum).

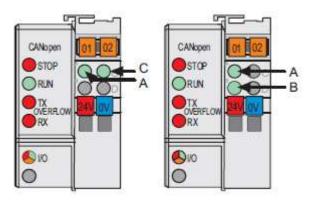
#### 10.2 Connector diagram

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



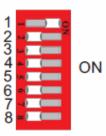
#### 10.3 Display elements

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						
IO	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	kB	kB	kB	kB	kB	kB	kB	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	"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

