
GCAN-PLC

Function Blocks for CANopen

User Manual

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|---------|------------|-------------------------|
| V1.00 | 2017/07/22 | Create document |
| V1.01 | 2017/11/20 | Revise |
| V1.02 | 2018/03/23 | Add new function blocks |

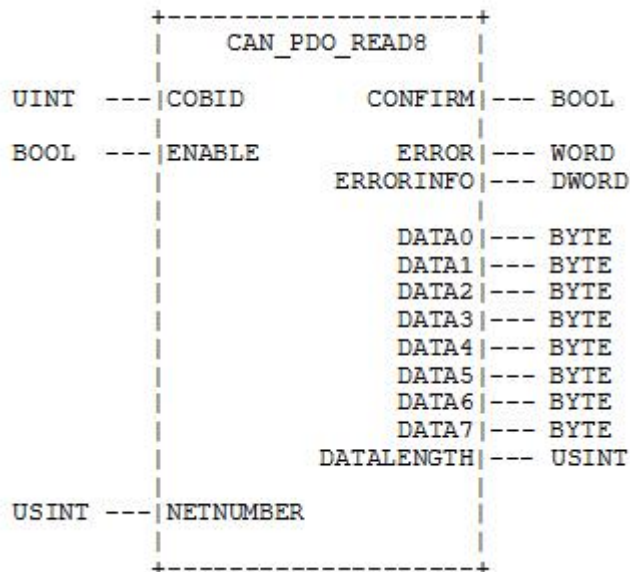
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1 CAN_PDO_READ8

FB for reading PDOs and CAN Layer 2 messages from the receive buffer of the network layer.

1.1 Prototype of the Function Block



1.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

COBID: COBID(CAN identifier) of the message to be read(PDO or CAN Layer 2)

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

DATA0 - DATA7: Data bytes of the received CAN message

DATALENGTH: Length of the received CAN message

ERRORINFO: Reserved for additional error information

CONFIRM: Output for message completed through the FB

ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR"

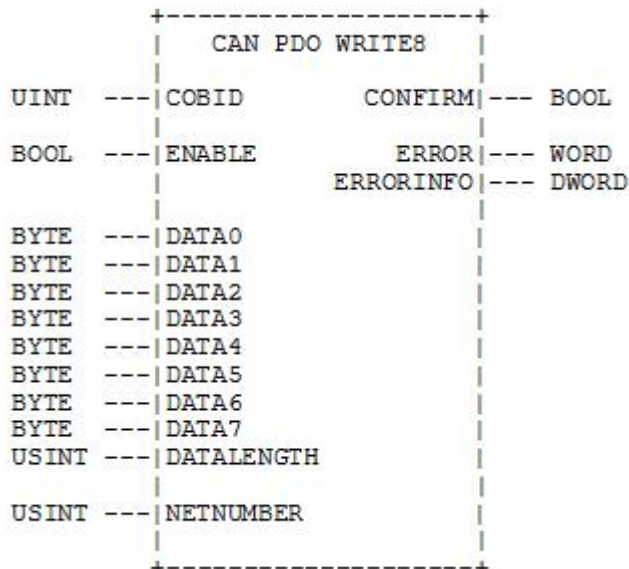
| In Hex | In Decimal | Error Code |
|---------|------------|------------------------------|
| 16#0000 | (= 00 dec) | NO_ERROR |
| 16#0001 | (= 01 dec) | OTHER_ERROR |
| 16#0002 | (= 02 dec) | DATA_OVERFLOW |
| 16#0003 | (= 03 dec) | TIME_OUT |
| 16#0010 | (= 16 dec) | CAN_BUS_OFF |
| 16#0011 | (= 17 dec) | CAN_ERROR_PASSIVE |
| 16#0021 | (= 33 dec) | GENERIC_ERROR |
| 16#0022 | (= 34 dec) | FUNCTION_NOT_AVAILABLE |
| 16#0023 | (= 35 dec) | NO_MASTER_MODE |
| 16#0024 | (= 36 dec) | INVALID_DEVICE |
| 16#0025 | (= 37 dec) | TRANSFER_BUSY |
| 16#0030 | (= 48 dec) | NO_SDO_CHANNEL_AVAILABLE |
| 16#0031 | (= 49 dec) | SDO_BUSY |
| 16#0032 | (= 50 dec) | SDO_INITIALIZE_ERROR |
| 16#0033 | (= 51 dec) | SDO_LENGTH_ERROR |
| 16#0034 | (= 52 dec) | SDO_ERROR (SDO Abort Code at |
| 16#0040 | (= 64 dec) | NO_VALID_DATA_AVAILABLE |
| 16#0041 | (= 65 dec) | COBID_ALREADY_REGISTERED |
| 16#0042 | (= 66 dec) | NO_FREE_COBID_TABLE_ENTRY |
| 16#0043 | (= 67 dec) | NO_SUCH_COBID_REGISTERED |
| 16#0044 | (= 68 dec) | NO_FREE_RECEIVE_CHANNEL |
| 16#0045 | (= 69 dec) | DATA_LENGTH_ZERO_NOT_ALLOWED |

Table 1 Constants for data type "CIA405_CANOPEN_KERNEL_ERROR"

2 CAN_PDO_WRITE8

FB for sending PDOs and CAN Layer 2 messages via the network layer.

2.1 Prototype of the Function Block



2.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

COBID: COBID (CAN identifier) of the message to be sent (PDO or CAN Layer 2)

DATA0 - DATA7: Data bytes of the CAN message to be sent

DATALENGTH: Length of the CAN message to be sent

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

ERRORINFO: Reserved for additional error information

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed;

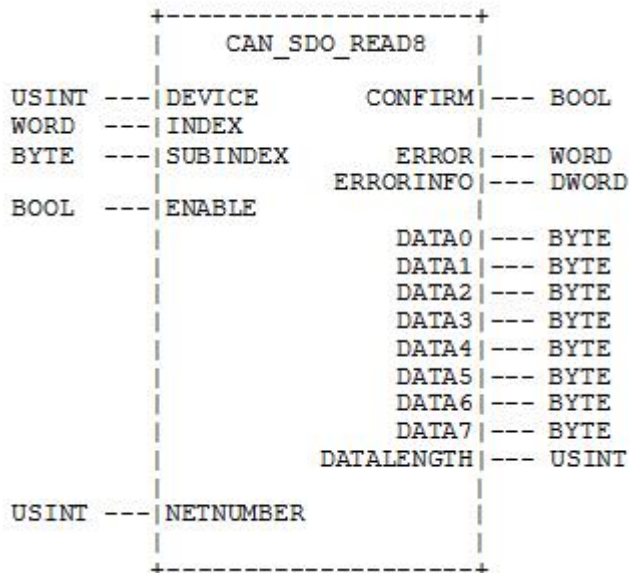
ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

3 CAN_SDO_READ8

FB for reading object entries of a node via SDO transfer.

3.1 Prototype of the Function Block



3.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

DEVICE: Address of the node to be read (1-127 or 0 for local OD)

SUBINDEX: Number of the subindex entry to be read

INDEX: Number of the index entry to be read

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

DATA0-DATA7: Data bytes of the read entry

DATALENGTH: Length of the read entry

ERRORINFO: SDO Abort Code of the communication partner according to data type "CIA405_SDO_ERROR"

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed;

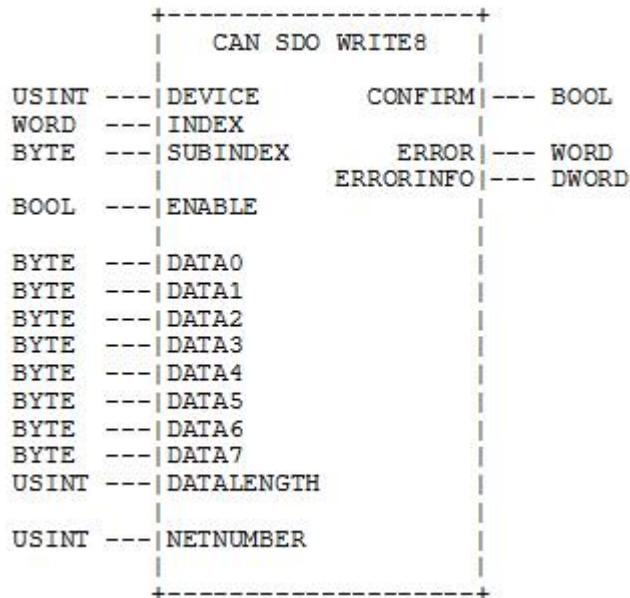
ERROR:Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

4 CAN_SDO_WRITE8

FB for writing object entries of a node via SDO transfer.

4.1 Prototype of the Function Block:



4.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

DEVICE: Address of the node to be written (1-127 or 0 for local OD)

SUBINDEX: Number of the subindex entry to be written

INDEX: Number of the index entry to be written

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

DATA0-DATA7: Data bytes of the entry to be written

DATALENGTH: Length of the entry to be written

ERRORINFO: SDO Abort Code of the communication partner according to the data type "CIA405_SDO_ERROR"

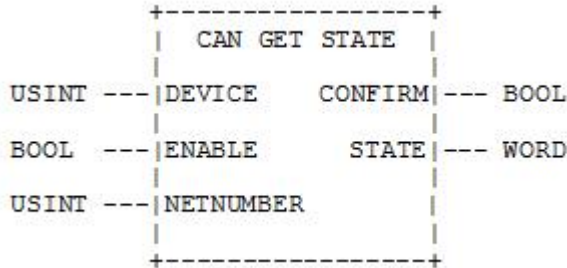
CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

ERROR:Error code according to data type
"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

5 CAN_GET_STATE

FB for requesting the node state of devices.

5.1 Prototype of the Function Block



5.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

DEVICE: Address of the node to be requested (1-127 or 0 for own node)

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

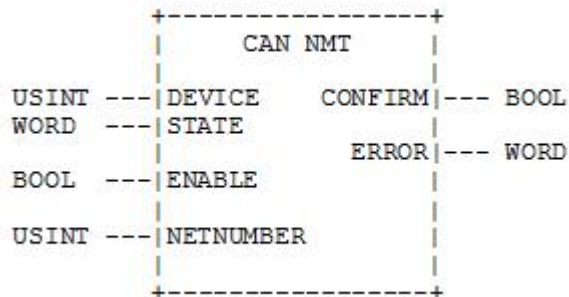
CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

STATE: Node state according to data type "CIA405_STATE" (see Table 1)

6 CAN_NMT

FB for sending NMT messages.

6.1 Prototype of the Function Block:



6.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

DEVICE: Address of the node to be controlled (1-127 or 0 for all nodes)

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

STATE: Node state according to data type "CIA405_TRANSITION_STATE"

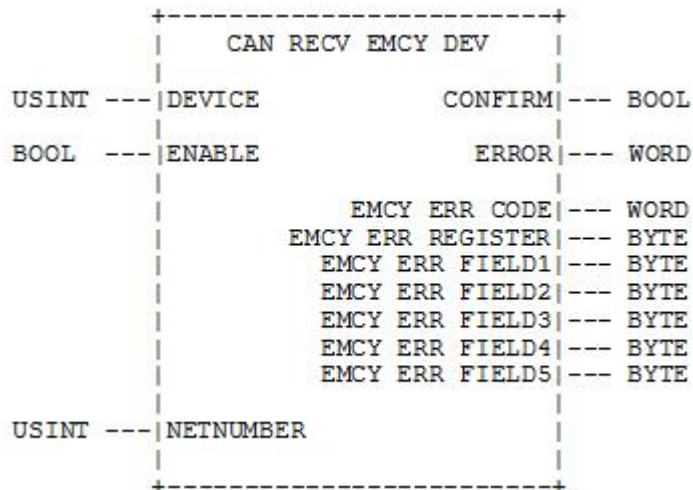
CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

ERROR: Error code according to data type
"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

7 CAN_RECV_EMCY_DEV

FB for reading emergency messages of a specific node from the receive buffer of the network layer.

7.1 Prototype of the Function Block:



7.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

DEVICE: Address of the node (1-127) for which the reception of emergency messages is to be checked

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

EMCY_ERR_CODE

EMCY_ERR_REGISTER

EMCY_ERR_FIELD1 - EMCY_ERR_FIELD5:

Emergency error information according to CiA Draft Standard 301

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

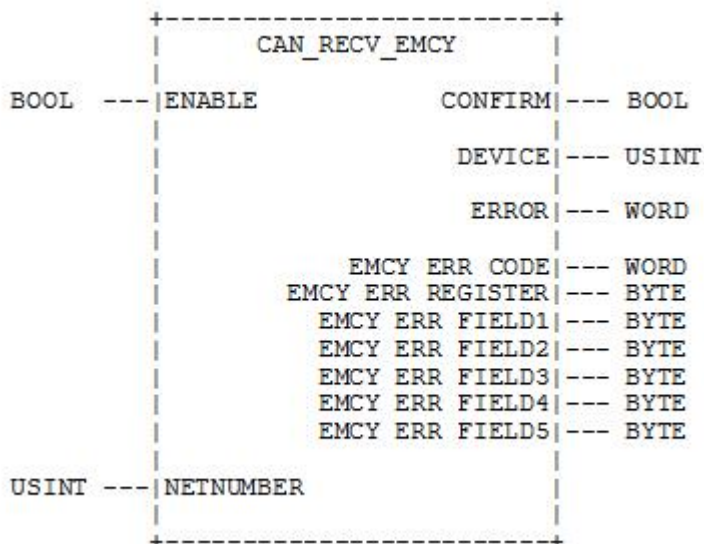
ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

8 CAN_RECV_EMCY

FB for reading emergency messages of any node from the receive buffer of the network layer.

8.1 Prototype of the Function Block



8.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

DEVICE: Address of the node (1-127) which received an emergency message

EMCY_ERR_CODE

EMCY_ERR_REGISTER

EMCY_ERR_FIELD1 - EMCY_ERR_FIELD5:

Emergency error information according to CiA Draft Standard 301

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

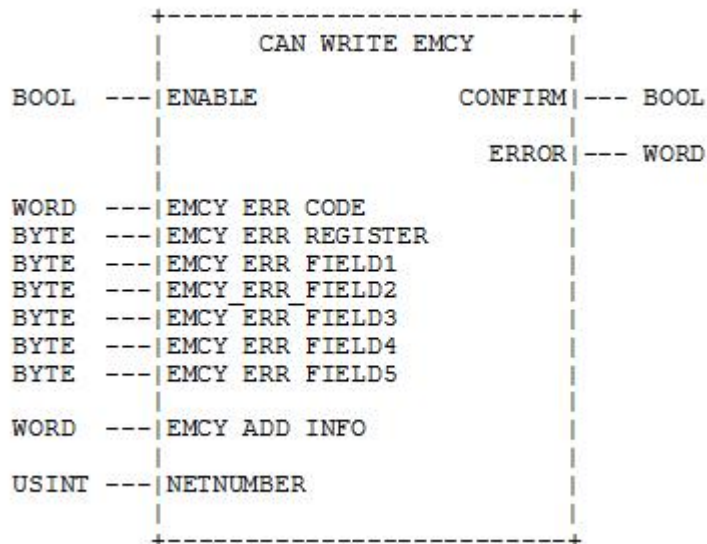
ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

9 CAN_WRITE_EMCY

FB for sending application-specific emergency messages via the network layer.

9.1 Prototype of the Function Block



9.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

EMCY_ERR_CODE

EMCY_ERR_REGISTER

EMCY_ERR_FIELD1 - EMCY_ERR_FIELD5: Emergency error information according to the CiA Draft Standard 301 for the emergency message to be sent

EMCY_ADD_INFO: Additional, user-specific emergency error information; is entered in Index 1003H of the Object Dictionary (Error Field, see CiA Draft Standard 301); is not a component of the emergency message to be sent, but is used for diagnosis purposes and can, therefore, also be zero

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

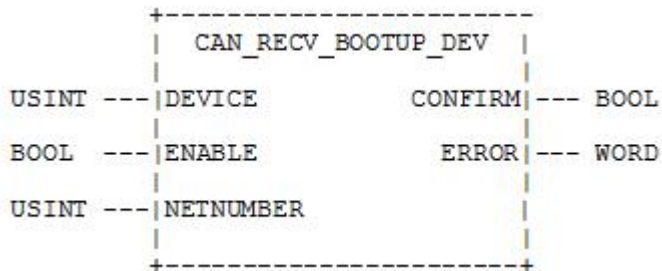
ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

10 CAN_RECV_BOOTUP_DEV

FB for reading bootup messages of a specific node from the receive buffer of the network layer.

10.1 Prototype of the Function Block



10.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

DEVICE: Address of the node (1-127) for which the reception of bootup messages is to be checked

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

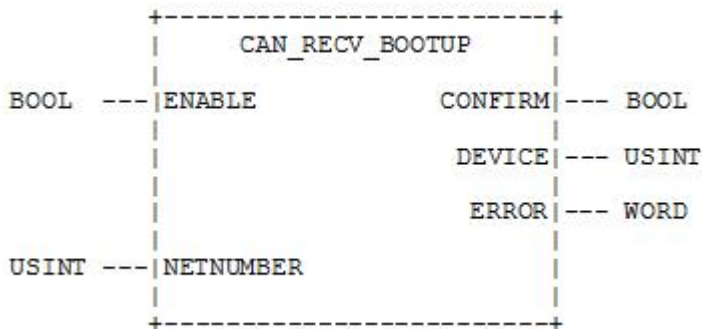
ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

11 CAN_RECV_BOOTUP

FB for reading bootup messages of any node from the receive buffer of the network layer.

11.1 Prototype of the Function Block



11.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

DEVICE: Address of the node (1-127) which received a bootup message

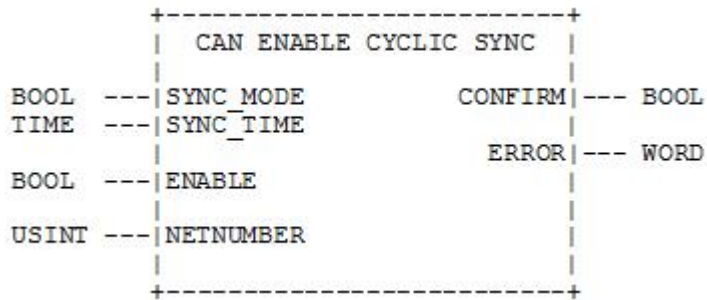
CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

ERROR: Error code according to data type
"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

12 CAN_ENABLE_CYCLIC_SYNC

FB for activating or deactivating cyclic SYNC messages.

12.1 Prototype of the Function Block



12.2 Definition of Operands

ENABLE: Input for enabling or disabling the FB

NETNUMBER: Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

SYNC_MODE:

TRUE = Activate the generation of cyclic SYNC messages
 FALSE = Deactivate the generation of cyclic SYNC messages

SYNC_TIME: Time between two consecutive SYNC messages or 0 for SYNC message after each PLC cycle

CONFIRM: Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

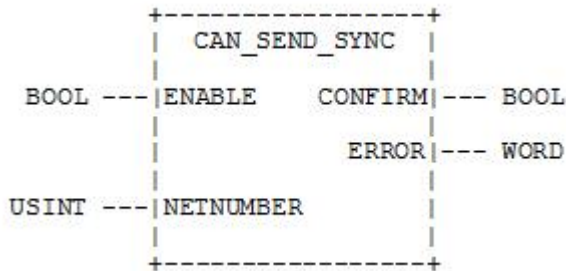
ERROR: Error code according to data type

"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

13 CAN_SEND_SYNC

FB for sending an individual SYNC message.

13.1 Prototype of the Function Block



13.2 Definition of Operands

ENABLE:Input for enabling or disabling the FB

NETNUMBER:Network number (Note: If the PLC only supports one CANopen interface, setting of this input can be skipped since numeric variables have already been set with the initial value 0 according to IEC61131)

CONFIRM:Output for message completed through the FB, FALSE indicates transmission failed or terminated after an error, TRUE indicates transmission successfully completed

ERROR:Error code according to data type
"CIA405_CANOPEN_KERNEL_ERROR" (see Table 1)

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