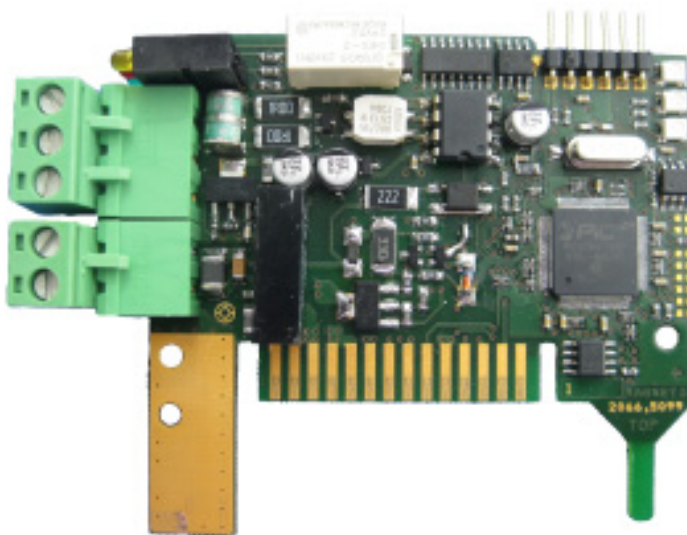


Technical Manual

ECN module MGC-PRO MicroDrive



This technical manual is a supplement for the operating instructions for the MHTM™ MicroDrive barriers, describing the ECN module.

Before using the ECN module, read this manual and the operating instructions of the respective MHTM™ MicroDrive barrier carefully!

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1 General

1.1 Information on the Manual

This manual offers important information on handling of the ECN module. The ECN module can only be operated installed in the MAGNETIC MHTM™ MicroDrive barriers with an MGC-PRO controller.

Prerequisite for secure work is compliance with all indicated safety notes, warning notes and instructions in this manual and in the respective operating instructions "Barrier MHTM™ MicroDrive". For better overview, the safety notes and warnings of the operating instructions are not repeated.

Before using the ECN module, read this manual and the operating instructions MHTM™ MicroDrive barrier carefully!



NOTE!

This technical manual is valid as of the following firmware version:

4915.3009 – v0.1

1.2 Function

The ECN module is a multifunctional module. You can use the ECN module for the following tasks:

- Parking place count
- Operation of the MHTM™ MicroDrive barriers
- Calling information from the MGC-PRO controller
- Set parameters for MGC-PRO controller via CAN bus.

General

1.3 Reference documents



NOTE!

This technical manual is based on the following documents.

All listed reference documents are available free of charge via the indicated procurement source.

Number	Title	Author	Procurement source
5815,5001	Operating instructions "Barrier MHTM™ MicroDrive Access and Parking"	MAGNETIC Autocontrol GmbH	info@ac-magnetic.com
5815,0009	Operating instructions "Barrier MHTM™ MicroDrive Access XL/XXL"	MAGNETIC Autocontrol GmbH	info@ac-magnetic.com
5815,0008	Operating instructions "Barrier MHTM™ MicroDrive Toll and Toll HighSpeed"	MAGNETIC Autocontrol GmbH	info@ac-magnetic.com
5816,0006	Description "Controller MGC and MGC-PRO for MHTM™ MicroDrive barriers"	MAGNETIC Autocontrol GmbH	info@ac-magnetic.com
5815,0000	MicroDrive MGC/MGC-PRO Additional Information for System integrators	MAGNETIC Autocontrol GmbH	info@ac-magnetic.com
CiA 301	CANopen application layer and communication profile	© CAN in Automation (CiA) e. V.	www.can-via.org

Table 1: Reference documents

1.4 Pictogram explanation

Warning notes

Warning notes are characterised by pictograms in this manual. It is absolutely essential to observe the notes and to proceed with caution in order to prevent property damage.

NOTICE



The signal word NOTICE points to a potentially harmful situation, which can lead to property damage if it is not avoided.

Hints and recommendations



NOTE!

... highlights useful hints and recommendations as well as information for an efficient and trouble-free operation.

1.5 Intended use

The plug-in module "ECN" is exclusively intended for expansion of the MGC-PRO control devices by the function "ECN". The plug-in module can only be operated installed in the MAGNETIC MHTM™ MicroDrive barriers. This plug-in module can be used to parameterise and control the MAGNETIC MHTM™ MicroDrive barrier via CAN bus.

Installation, connection and commissioning of the ECN module and operation via the ECN module must only be performed by specialists.

Any types of claims due to damage arising from improper use are excluded. The operator alone shall be responsible for any damage arising from improper use.



NOTE!

→ For more information on the barrier MHTM™ MicroDrive, see the respective operating instructions.

See page 6, chapter 1.3 "Reference documents".

Technical data

2 Technical data

Designation	Unit	Value
Total current consumption	–	50 mA at 24 V

Table 2: Technical data ECN module

Designation	Unit	Value
Max. line length	m	1000
Cable type	–	1x2 (twisted), shielded; Cross-section: 0.75 to 0.8 mm ² (AWG 19)
Plug type	–	Spring clip max. 2,5 mm ²
Protocol	–	CANopen according to CiA DS-301, one SDO server (0x580 + NodeID, 0x600 + NodeID)
Bit rate	kbit	50

Table 3: Technical data CAN connection (terminal X1)

Designation	Unit	Value
Power consumption output	–	30 mA at 19 V
Max. line length	m	100
Cable type	–	1x2; cross-section: 0.75 to 0.8 mm ² (AWG 19)
Plug type	–	Spring clip max. 2,5 mm ²

Table 4: Technical data IO connection (terminal X2)

3 Installation and network connection

3.1 Installing ECN module in control unit MGC-PRO

Hints and recommendations

**NOTE!**

The ECN module can only be operated with the MAGNETIC control units MGC-PRO.

The ECN module is installed and set in the factory. Observe the following safety note in case of retrofitting by the customer.

Retrofitting ECN module

NOTICE**Property damage from improper installation and improper commissioning.**

- Only qualified specialists must install, connect and commission the ECN module.
- Take ESD precautions and comply with them.

1. Open barrier casing according to the operating instructions for the barrier MHTM™ MicroDrive. Observe warning notes.
2. Switch off power supply. Ensure that the system is powered down. Secure against reactivation. The balancing springs in the lever system are relaxed.
3. Take care when opening control unit cover.
4. Plug in plug-in module in a free slot.

**NOTE!**

Slot selection influences the plug-in module's module address.

5. Switch on power supply.
6. Check LEDs at the plug-in module. The green LED 2 "system bus" must light up. → If applicable, refer to page 30, chapter 8.2 "Troubleshooting".
7. The main menu shows the menu "ECN module".
8. Apply cover of the control unit.
9. Close barrier casing according to the operating instructions for the barrier MHTM™ MicroDrive.

Installation and network connection

3.2 Connections and display elements

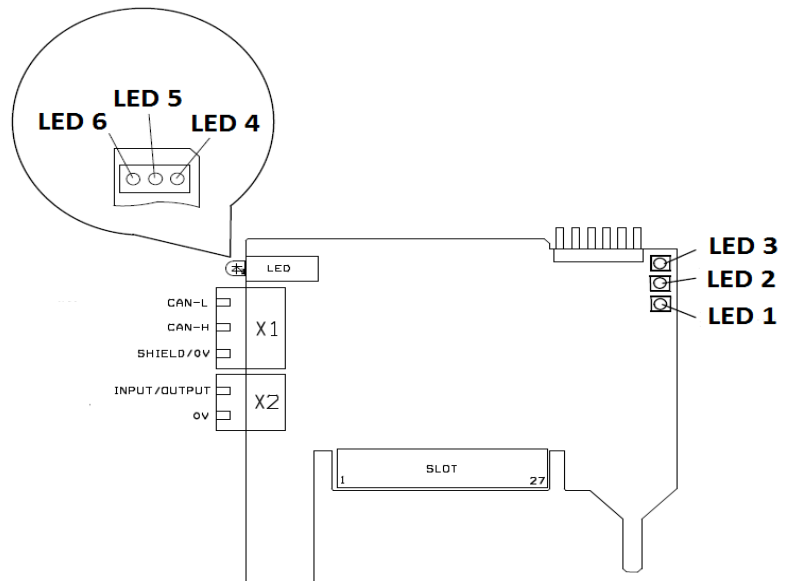


Fig. 1: Overview of connections and display elements (LEDs) at the ECN module

Connections

The following connections are available for customer-side connections at the ECN module:

- X1: 3-pin terminals for external CAN bus
- X2: 2-pin terminal for input/output connection

Display elements (LEDs)

The following display elements are present:

LED	Colour	Option
1	Red	System bus, error LED
2	Green	System bus, run LED
3	Green	Debug-LED (internal use)
4	Red	External CAN-bus, error LED
5	Green	External CAN-bus, run LED
6	Yellow	External CAN-Bus, bus terminals on/off

Table 5: Display elements (LEDs)

3.3 Performing external CAN-Bus network connection

Connect the individual ECN modules to each other according to the following figure.

→ For the cable specifications, see page 8, chapter 2.

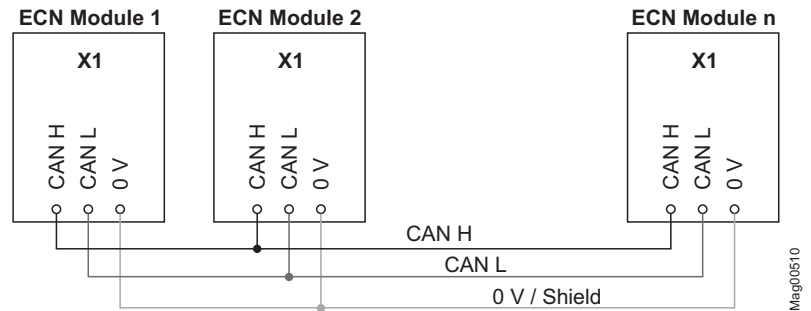


Fig. 2: Wiring ECN modules

3.4 Defining master and slave and assigning addresses

Automatic address assignment is activated in the delivery condition. This mode ensures that each module is assigned a unique address and that this address is automatically replaced when the module is replaced.

3.4.1 Master

You need to define an ECN module as a master within the external CAN bus. The master assumes special administrative tasks.

NOTICE



Malfunction from several masters within one CAN bus.

- Ensure that there is only one master in the network.

The master module is automatically assigned address "1" when "Enabled" was chosen for the parameter "Master". → Refer to page 13, Parameter "Master", menu path: Main menu > ECN module > Setup > ECN network

Installation and network connection

3.4.2 Slave

The other participants in the external CAN bus are called slave modules.

The master can administrate up to 31 slaves.

Auto. address alloc. "Active"

If the automatic address assignment is activated, each slave is automatically assigned an address at the first start of the network. This address is stored to the non-volatile memory of the module. After a voltage outage, the address is used again.



NOTE!

The automatic address assignment can take up to one minute.

Activate automatic address assignment via the parameter "Auto. address alloc." → See page 13, parameter "Auto. address alloc.", menu path: Menu path: Main menu > ECN module > Setup > ECN network

Auto. address alloc. "Inactive"

With the address assignment switched off, you have to set the address.



NOTE!

When setting the address, make sure to assign each participate a different address in the CAN network.

3.5 Menu "ECN module" of the control unit MGC-PRO

Once the ECN module is plugged in and the control unit supplied with power, the menu "ECN module" appears in the main menu. The position of the menu ECN module in the main menu depends on the other plug-in modules installed and the slot used.

3.5.1 Menu "Setup"

Menu "ECN network"

Use the menu "ECN network" to parameterise the external CAN bus.



Operating view → Main menu → ECN module → Setup → ECN network	
Parameters	Description
Master	Define module as a master or slave module.  NOTE! <i>There must only be one master per network. This setting is only assumed after a voltage reset.</i> Options <input type="checkbox"/> Inactive: ECN module is defined as a slave. <input type="checkbox"/> Enabled: ECN module is defined as a master. Factory setting <input type="checkbox"/> Inactive
Termination	Switch CAN bus termination on and off.  NOTE! <i>Each network must only have termination on at the first and last module.</i> Options <input type="checkbox"/> On <input type="checkbox"/> Off Factory setting <input type="checkbox"/> Off
Auto. address alloc.	Switching automatic address allocation on or off. Options <input type="checkbox"/> Inactive: Automatic address allocation off <input type="checkbox"/> Enabled: Automatic address allocation on Factory setting <input type="checkbox"/> Enabled
Address	Display of the current bus address of the module on. If the module shows the value "255", no valid address has been assigned to the module yet. → For addressing, see page 11, chapter 3.4.

Table 6: Menu "ECN network"

Installation and network connection

Menu "Counting"

Use the menu "Counting" to parameterise the function "Lot count".

Operating view → Main menu → ECN module → Setup → Counting	
Parameters	Description
Enabled	Switching "Lot count" on or off. Options <ul style="list-style-type: none"> ■ On ■ Off Factory setting <ul style="list-style-type: none"> ■ Off
Direction of traffic	Select direction of traffic for the lot count. Options <ul style="list-style-type: none"> ■ 1 direction, ENTRY ■ 1 direction, EXIT ■ 2 directions Factory setting <ul style="list-style-type: none"> ■ 1 direction, ENTRY
Zones	Select zones for the lot count. Options <ul style="list-style-type: none"> ■ 1 zone ■ 1 zone, selective ■ 2 zones Factory setting <ul style="list-style-type: none"> ■ 1 zone

Table 7: Menu "Counting"

Menu "Lot counter"

Use the menu "Lot counter" to parameterise the function "Lot counter".


NOTE!

If the slave module did not have any valid address assigned yet, the value "0" is displayed for the parameters "Cap. zone 1", "Free zone 1", "Cap. zone 2" and "Free zone 2". → For addressing, see page 11, chapter 3.4.

Operating view → Main menu → ECN module → Setup → Lot counter	
Parameters	Description
Cap. zone 1	Displaying and setting the number of available lots for zone 1. Factory setting ■ 9999
Free zone 1	Displaying and correcting the number of available lots for zone 1.
Cap. zone 2	Displaying and setting the number of available lots for zone 2. Factory setting ■ 9999
Free zone 2	Displaying and correcting the number of available lots for zone 2.
Hysteresis zone 1	Enter hysteresis for zone 1 for the status "full". One the counter for zone 1 is set to "zero", zone 1 acquires the status "full". Only when the counter is equal to the setting for the parameter "Hysteresis zone 1" will the status "full" be revoked. Factory setting ■ 1
Hysteresis zone 2	Enter hysteresis for zone 2 for the status "full". Factory setting ■ 1
Reset counters	Resetting the lot counter. Enter the corresponding figure. Options ■ 1: Resetting counter for zone 1. ■ 2: Resetting counter for zone 2. ■ 3: Resetting counter for zone 1 and zone 2.

Table 8: Menu "Lot Counter"

Installation and network connection

3.5.2 Menu "Information"

Operating view → Main menu → ECN module → Information	
Menu	Description
Serial no.	Display of the serial number of the ECN module
Hardware Version	Display of the hardware version of the ECN module
Software #	Display of the software number of the ECN module
SW version	Display of the software version of the ECN module

Table 9: Menu "Information"

4 Parking place count

4.1 Overview of Counting Versions, terms

The ECN module permits counting in- and outbound vehicles. The count can be either in standalone operation at one barrier, or at up to 32 barriers. The barriers must be linked through ECN modules.

We recommend only using the lot count in the automatic operating modes 5 to 8 of the MGC-PRO control unit.

There are two counting zones available. The vehicle count can be influenced by selecting the Direction of traffic and zones.

Term	Explanation
1 direction, ENTRY 1 direction, EXIT	In this count version, the barrier is only operated in one direction. The barrier system must comprise at least 2 barriers. One barrier is used for entrance (ENTRY). The other barrier is used for exit (EXIT). You can connect more barriers for entrance and exit. Incoming vehicles decrement and outbound vehicles increment the lot counter/s.
2 directions	For this counting version, the barrier is used in both in- and outbound directions. You can use this count version with one or several barriers. Incoming vehicles decrement and outbound vehicles increment the lot counter/s.
Selective count	If the option "1 Zone" was chosen for the parameter "Zones", all vehicles that enter or leave 1 are counted for zone through a command at the input "Open low priority" or "Open high priority". If the option "1 Zone, selective" was chosen for the parameter "Zones", all vehicles that enter or leave 1 are counted for zone through a command at the input "Open low priority". Vehicles that enter or leave through a command at the input "opening superordinated" are not counted for zone 1. → Also see parameter "2 Zones". If the counter for zone 1 is set to zero, no vehicles can enter anymore via a command at the input "Open low priority". However, vehicles can still enter via a command at the input "Open high priority".
2 zones	If "2 zones" was chosen for the parameter "Zones", vehicles that enter via a command at the input "Open high priority" are counted for the 2nd zone (2nd counter).

Table 10: Overview of counting versions, terms

If all lots of the 1st parking zone are occupied, the output at the MGC-PRO controller is activated with function "1st parking zone full". Additionally, the controller ignores all opening signals with a low priority, such as "Open low priority".

If all lots of the 2nd parking zone are occupied, the output at the MGC-PRO controller is activated with function "2nd parking zone full". The controller does not perform any further measures.

With the parking place count deactivated, no vehicles are counted. The lot count is deactivated if the option "Off" was selected in the menu "Counting" for the parameter "Enabled".

Parking place count

4.2 Counting versions

Different settings for the parameters "Direction of traffic" and "Zones" provide the following counting versions:

Counting versions at separate direction of traffic

- One direction of traffic at separate entry and exit
- Selective count with two driving directions at separate entry and exit
- Selective count with two zones and at separate entry and exit

Count versions with two directions of traffic

- Simple count with direction recognition
- Selective count with direction recognition
- Selective count with two zones and direction recognition

4.3 Counting versions at separate entry and exit

These counting versions are intended for barrier systems with separate entry and exit. The barrier system must comprise at least 2 barriers.

4.3.1 One direction of traffic at separate entry and exit

Menu	Option
Direction of traffic	<ul style="list-style-type: none"> ■ 1 direction, ENTRY: Barrier entrance ■ 1 direction, EXIT: Barrier exit
Zones	1 zone

Table 11: Parameter settings

The barrier with the ECN module defined as a master assumes lot counting and is located at the entrance.

If the number of free lots in zone 1 is above zero, the barrier opens either by a command at the input "Open low priority", "Open high priority" or "Open exit" or by running over the opening loop.

This count version is independent of direction. The count takes place when the safety loop is drive over. If the barrier is at an entrance, you need to choose option "1 direction ENTRY" for the parameter "Direction of traffic". If the barrier is at an exit, you need to choose option "1 direction EXIT" for the parameter "Direction of traffic".

If the zone is full, the commands at the inputs "Open low priority" and "Ext. opening loop entrance" are ignored.

The barrier in the entrance can still be opened via the command at the input "Open low priority". The barrier for the exit can be opened either via a command at the input "Open exit" or by driving over the opening loop.

Zone 1 has status "full", until the number of free parking places is the same as or larger than the setting for the parameter "Hysteresis zone 1".

4.3.2 Selective count with one direction of traffic at separate entry and exit

Menu	Option
Direction of traffic	<ul style="list-style-type: none"> ■ 1 direction, ENTRY: Barrier entrance ■ 1 direction, EXIT: Barrier exit
Zones	1 zone, selective

Table 12: Parameter settings

The barrier with the ECN module defined as a master assumes lot counting and is located at the entrance.

If the number of free lots in zone 1 is above zero, the barrier opens either by a command at the input "Open low priority", "Open high priority" or "Open exit".



NOTE!

You must not use any opening loops in this count version.

This count version is independent of direction. The count takes place when the surveillance loop is drive over. If the barrier is at an entrance, you need to choose option "1 direction, ENTRY" for the parameter "Direction of traffic". If the barrier is at an exit, you need to choose option "1 direction EXIT" for the parameter "Direction of traffic".



NOTE!

Vehicles that enter via a command at the input "Open high priority" are not counted.

If the zone is full, the commands at the inputs "Open low priority" and "Ext. opening loop entrance" are ignored.

The barrier in the entrance can still be opened via the command at the input "Open low priority". The barrier for the exit can be opened either via a command at the input "Open exit" or by driving over.

Zone 1 has status "full", until the number of free parking places is the same as or larger than the setting for the parameter "hysteresis zone 1".

Parking place count

4.3.3 Selective count with two zones at separate entry and exit

Menu	Option
Direction of traffic	<input type="checkbox"/> 1 direction, ENTRY: Barrier entrance <input type="checkbox"/> 1 direction, EXIT: Barrier exit
Zones	2 zones

Table 13: Parameter settings

The barrier with the ECN module defined as a master assumes lot counting and is located at the entrance.

If the number of free lots in zone 1 is above zero, the barrier opens either by a command at the input "Open low priority", "Open high priority" or "Open exit".



NOTE!

You must not use any opening loops in this count version.

This count version is independent of direction. The count takes place when the surveillance loop is drive over. If the barrier is at an entrance, you need to choose option "1 direction, ENTRY" for the parameter "Direction of traffic". If the barrier is at an exit, you need to choose option "1 direction EXIT" for the parameter "Direction of traffic".



NOTE!

Vehicles that enter via a command at the input "Open high priority" are not counted.

If zone 1 is full, the command at the input "Open low priority" is ignored. Open the barrier for the exit via a command at the input "Open exit".

If zone 2 is full, a command at the input "Open high priority" can be used for driving in or out.

A zone has status "full", until the number of free parking places is the same as or larger than the setting for the parameter "Hysteresis zone 1" or "Hysteresis zone 2".

4.4 Count versions with two driving directions

These counting versions are intended for barrier systems with separate entry and exit via one lane. Standalone operation with only one barrier or master-slave operation with several barriers is possible here. Each barrier must be equipped with at least two loops: one monitoring and one opening or presence loop.

These count versions are direction-dependent. Whether a vehicle is counted as driving or out depends on the position of the opening and presence loop. Use the parameter "Mode" in the menu "Detector" to specify whether the loop is work as an entrance or exit loop. If the loop is outside of the parking place, e.g. before the entrance barrier, it is an entrance loop.

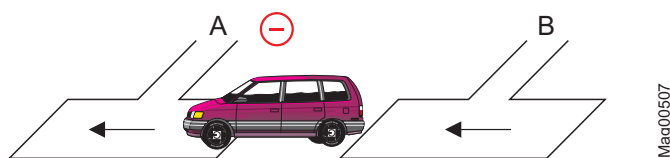


Fig. 3: Pulse generation at an entrance loop (minus pulse)

- A Safety loop
- B Opening loop entrance or presence loop entrance

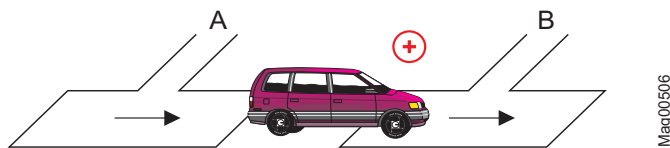


Fig. 4: Pulse generation at an entrance loop (plus pulse)

- A Safety loop
- B Opening loop entrance or presence loop entrance

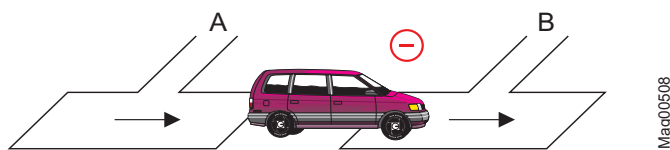


Fig. 5: Pulse generation at an exit loop (minus pulse)

- A Safety loop
- B Opening loop exit or presence loop exit

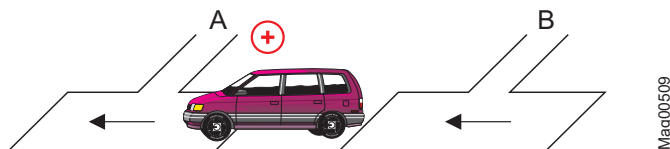


Fig. 6: Pulse generation at an exit loop (plus pulse)

- A Safety loop
- B Opening loop exit or presence loop exit

Parking place count

4.4.1 Simple count with direction recognition

Menu	Option
Direction of traffic	2 drive directions
Zones	2 zones

Table 14: Parameter settings

The barrier with the ECN module defined as a master assumes lot counting and is located at the entrance.

If the number of free lots in zone 1 is above zero, the barrier opens either by a command at the input "Open low priority", "Open high priority" or "Open exit" or by running over the opening loop.

This count version is dependent on direction. Incoming vehicles decrement the counter for zone 1. Exiting vehicles increment the counter.

If the zone is full, the commands at the inputs "Open low priority" and "Ext. Opening loop entry" are ignored.

The barrier in the entrance can still be opened via the command at the input "Open low priority". The barrier for the exit can be opened either via a command at the input "Open exit" or by driving over the opening loop.

Zone 1 has status "full", until the number of free parking places is the same as or larger than the setting for the parameter "hysteresis zone 1".

4.4.2 Selective count with direction recognition

Menu	Option
Direction of traffic	2 drive directions
Zones	1 zone, selective

Table 15: Parameter settings

The barrier with the ECN module defined as a master assumes lot counting and is located at the entrance.

If the number of free lots in zone 1 is above zero, the barrier opens either by a command at the input "Open low priority", "Open high priority" or "Open exit".



NOTE!

You must not use any opening loops in this count version.

This count version is dependent on direction. Incoming vehicles decrement the counter for zone 1. Exiting vehicles increment the counter.


NOTE!

Vehicles that enter via a command at the input "Open high priority" are not counted.

If the parking zone is full, the commands at the inputs "Open low priority" and "Ext. opening loop entrance" are ignored.

The barrier in the entrance can still be opened via the command at the input "Open low priority". The barrier for the exit can be opened either via a command at the input "Open exit" or by driving over the opening loop.

Zone 1 has status "full", until the number of free parking places is the same as or larger than the setting for the parameter "hysteresis zone 1".

4.4.3 Selective count with two zones and direction recognition

Menu	Option
Direction of traffic	2 drive directions
Zones	2 zones

Table 16: Parameter settings

The barrier with the ECN module defined as a master assumes lot counting and is located at the entrance.

If the number of free lots in zone 1 is above zero, the barrier opens either by a command at the input "Open low priority", "Open high priority" or "Open exit".


NOTE!

You must not use any opening loops in this count version.

This count version is dependent on direction. Incoming vehicles decrement the counter. Exiting vehicles increment the counter.


NOTE!

Vehicles that enter through a command at the input "Open high priority" are not counted for zone 2.

Parking place count

If zone 1 is full, the command at the input "Open low priority" is ignored.

The barrier in the exit can still be opened via the command at the input "Open exit".

If zone 2 is full, a command at the input "Open high priority" can be used for driving in or out.

A zone has status "full", until the number of free parking places is the same as or larger than the setting for the parameter "Hysteresis zone 1" or "hysteresis zone 2".

5 Output function

Terminal X2 is firmly assigned the output function "Zone 1".

6 Operating barrier via CAN-Bus

The CAN-bus offers the following options for operation of the barrier:

- a service data object (SDO)
- a process data object (PDO).



NOTE!

If you connect a superordinate control to the external CAN bus, observe that the bit rate for the external CAN bus is 50 kbit. A wrong bit rate impairs communication.

6.1 Operating barrier via SDO

You can operate the barrier via the SDO object 0x2006, subindex "0". The address of the respective ECN module must be known. The address can be read, e.g. via the display of the MGC-PRO controller, menu path: Main menu > ECN module > Setup > ECN network > Address

For operation of the barrier, you need to write to the SDO object 0x2006, subindex 0 of the desired ECN module. The following values are admitted:

- 0x00004000: Opening (Bit 14)
- 0x00008000: Closing (Bit 15)
- 0x00010000: Permanent opening superordinated (Bit 16)
- 0x00000000: Deletes a permanent opening flag



NOTE!

Bits 14 and 15 are deleted automatically. Bit 16 must be deleted manually.

The conduct of the barrier depends on the set programme mode.

Operating barrier via CAN-Bus

6.2 Operating barrier via PDO

For operation of the barrier via PDO, the process data object (PDO) with COBID 0x382 was set up. The length of the PDO is 8 Bytes or 64 Bit.

The 64 Bits are firmly assigned to the bus addresses of the ECN modules. Each ECN module has two bits available.

- Bits 0 to 1: Barrier at ECN module with address 1
- Bits 2 to 3: Barrier at ECN module with address 2
- ...
- Bits 60 to 61: Barrier at ECN module with address 31
- Bits 62 to 63: Barrier at ECN module with address 32

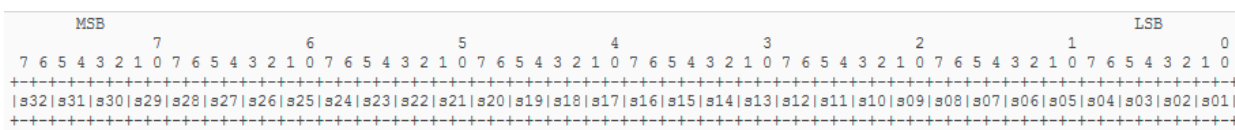


Fig. 7: Structure of the 64 Bits of the PDO. Each module has two bits available.

These two bits of the individual modules are assigned as follows:

- 00: Barrier does not perform any action
- 01: Open high priority
- 02: Delete opening superordinated
- 03: Delete opening superordinated and close barrier

Examples for operating the barrier via PDO

Action	PDO-data (8 Bytes)
Barrier at ECN module with address 1 permanently opening	0x0000000000000001
Barrier at ECN module with address 1 closing	0x0000000000000003
Barrier at ECN module with address 2 permanently opening	0x0000000000000004
Barrier at ECN module with address 2 closing	0x000000000000000C
All barriers permanently opening	0X5555555555555555
All barriers closing	0XFFFFFFFFFFFFFFFF

Table 17: Examples for operating the barrier via PDO

7 Remote access to the system bus

The ECN module permits remote access to the system bus of the MGC-PRO controller. Thus, you can read and write the parameters of all plugged modules.



NOTE!

If you connect a superordinate control to the external CAN bus, observe that the bit rate for the external CAN bus is 50 kbit. A wrong bit rate impairs communication.

7.1 Module addresses on the system bus

The MGC-PRO control unit is modularly built. Every plug-in module has a unique basic address. The module address is the sum of the basic address and slot number. The module address enables operation of several equal plug-in modules like two detector modules in the same control unit.

Basic addresses

Basic address	Plug-in module
0x01	MGC logic and motor control
0x02	
0x09	Detector module
0x10	ECN module
0x18	Radio module
0x20	Ethernet Module
0x28	RS485/422 module

Table 18: Basic addresses of the plug-in modules

The RS485/422 modules can have the addresses 0x28 to 0x2F. To be able to access parameters of the RS485/422 module, the module address must be known.

Remote access to the system bus

7.2 Objects for remote access

Object 0x2200, subindices

Remote access happens by two SDO writing and reading processes on the object 0x2200. The object offers the following subindices:

Sub-index	Function
0x01	Set the module address, index and subindices of the object you want to access. The subindex 0x01 is a 32-Bit object that must be used as follows: <ul style="list-style-type: none"> ■ Byte 3 (MSB): Module address ■ Byte 2 and 1: Desired index ■ Byte 0 (LSB): Desired subindices
0x02	Reading, writing of a U8/I8-object
0x03	Reading, writing of a U16/I16-object
0x04	Reading, writing of a U32/I32-object
0x05	Reading, writing of a U32/I32-object
0x06	Reading, writing of a VS-object

Table 19: Object 0x2200, subindices



NOTE!

Remote access to the target object is only properly possible if you are using the right subindex. The subindex must match the data type of the target object

7.3 Examples for remote access

Proceed as follows for remote access:

1. Writing desired values such as target address, subindex and index to the subindex 0x01 of the object 0x2200.
2. Depending on data type of the desired object, perform a reading or writing process on the right subindex of the object.

Setting programme mode:
Object 2100, subindex 0x01 at the
master, address 0x01

Sub-index	Operation	Value
0x01	Writing	0x01210401
0x02	Writing	New value, e.g. 0x05

Table 20: Object 0x2100, set subindex 1

Remote access to the system bus

**Read error code:
Object 2003, subindex 0x02 at the
master, address 0x01**

Sub-index	Operation	Value
0x01	Writing	0x01200302
0x03	Reading	Result, e.g. 0x6000

Table 21: Object 0x2003, Read subindex 2

**Reading cycle counter:
Object 2100, subindex 0x01 at the
master, address 0x01**

Sub-index	Operation	Value
0x01	Writing	0x01210101
0x04	Reading	Result, e.g. 10861

Table 22: Object 0x2100, read subindex 1

**Permitted function for digital
output 1 reading:
Object 2111, subindex 0x01 at the
master, address 0x01**

Sub-index	Operation	Value
0x01	Writing	0x01210401
0x05	Reading	Result, e.g.: 0xE0333333C3C7FEFF

Table 23: Object 0x2111, read subindex 1

**Read device name:
Object 1008, subindex 0x00 at the
master, address 0x01**

Sub-index	Operation	Value
0x01	Writing	0x01100800
0x06	Reading	Result, e.g. "Logic Controller"

Table 24: Object 0x1800, Read subindex 0

The document 5815,0000 "MicroDrive MGC/MGC-PRO Additional Information for System integrators" contains the customer-relevant objects for each available plug-in module.

Commissioning

8 Commissioning

8.1 Procedure

We recommend the following procedure for initial commissioning:

1. Perform wiring.
2. Disconnect terminal X1.
3. Specify master module.
4. Activate first and last module in the bus.
5. Activate all other slave modules.
6. Activate master module.
7. Perform settings via the menu.
 - Activate termination at the first and last module in the bus.
 - Set the master settings with the specified master module.
8. Switch off all modules.
9. Push on terminal X1.
10. Switch on all modules.
11. Check function.

8.2 Corrective action

→ For the position of the LEDs, see page 10, Table 5.

Malfunction	Possible cause	Corrective action
Green LED 2 "System bus" is not lit.	The ECN module is only supported by the control units MGC-PRO.	Check label or type sign of the control unit.
	The ECN module is not plugged in correctly.	Check plug contacts. Plug in ECN module again.
	Firmware update not performed correctly.	Perform firmware update via the service module SM01.
The menu for the ECN module is not displayed.	The ECN module is not plugged in correctly.	Check plug contacts. Plug in ECN module again.
	Firmware update not performed correctly.	Perform firmware update via the service module SM01.
Error 0xFF51	Module with the own address already present	Change address to switch to automatic address assignment.
Green LED 5 "External CAN-bus" flashes.	Module expects being targeted by the master.	Ensure that there is a master in the network.
Red LED 6 "external CAN-bus" at the master module flickers.	No connection to other modules.	Check wiring.

Table 25: Corrective action

9 Appendix

The description of the status words and object tables are available in document 5815,0000 "MicroDrive MGC/MGC-PRO Additional Information for System integrators".

10 List of abbreviations

Abbreviation	Meaning	Description
ECN	External CAN Network	Designation for the external CAN-network
MGC-PRO	Magnetic Gate Controller	Control unit for the MicroDrive MHTM™ barriers, PRO version
CANopen	Controller Area Network	Protocol for the CAN bus
SDO	Service data object	Object for setting parameters of object directory entries
PDO	Process data object	Object for the transport of process data

Table 26: List of abbreviations

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