



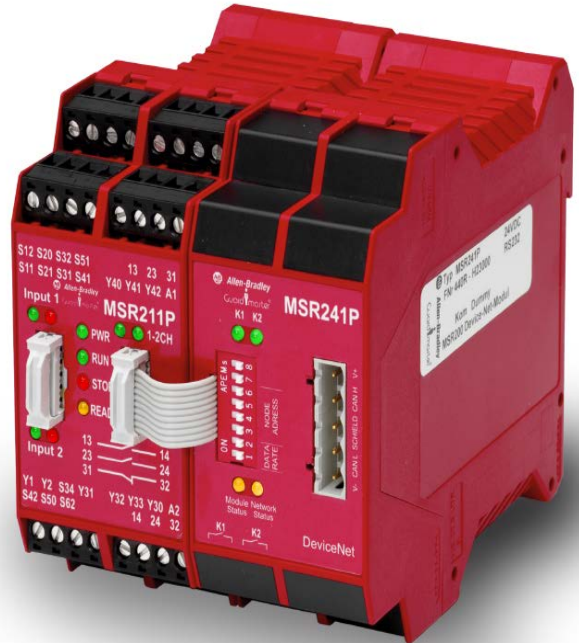
Installation Instructions MSR241

Installing MSR241

Follow these steps, to install the MSR241 module:

1. Set the Node Address and the Baud rate on the module.
2. Connect the MSR241 with the safety system MSR200 via ribbon cable.
3. Connect the relay outputs
4. Connect the DeviceNet Cable.
5. Communicate with the MSR241 module.

These steps are explained in detail in the following procedures.



Set the Node Address and Baud Rate on the module

The address can be set between 00 and 63.

Address	Dip switch 8	Dip switch 7	Dip switch 6	Dip switch 5	Dip switch 4	Dip switch 3
0	off	off	off	off	off	off
1	off	off	off	off	off	on
2	off	off	off	off	on	off
3	off	off	off	off	on	on
4	off	off	off	on	off	off
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60	on	on	on	on	off	off
61	on	on	on	on	off	on
62	on	on	on	on	on	off
63	on	on	on	on	on	on

The baud rate can be set to:
125kB, 250kB, 500kB

Baud rate	Dip switch 2	Dip switch 1
125kB	off	off
250kB	off	on
500kB	on	off
Invalid (Module Status LED solid red)	on	on

Connect the MSR241 with the safety system MSR200 via ribbon cable

The MSR241 mount to a panel or DIN rail, which must be grounded before installing the module.

Connect the MSR241 either to the Basic module or to an output extension module on the right side of the MSR200 safety system via ribbon cable. The terminator for the EDM loop is integrated in the MSR241.

Connect the relay outputs

If you want to use the relay outputs of the MSR241 connect them to your application.

Connect the DeviceNet Cable

Refer to following information when connecting the DeviceNet wire to the MSR241.

1. Connect the DeviceNet cable (drop line) to the unsealed DeviceNet terminal connector.
2. Connect the terminal connector to the module. Use the side screws on the terminal connector to fasten it to the module.

IMPORTANT

Pin Number	Wire Color	Abbreviation	Description
1	Black	V-	Power return
2	Blue	CAN_L	Data line (CAN Low)
3	Clear	Shield	Between cable jacket and wire
4	White	CAN_H	Data line (CAN High)
5	Red	V+	Positive voltage (hot)

The bus cable must be terminated with a resistor (121 Ω / +/- 1% / 0,25W). The resistor is contacted with CAN_H and CAN_L.

Communicate with the MSR241 module

To transfer data from MSR241 to the D-Net it is required to upload the “**Electronic Data Sheet**” (EDS file). This file is available for free download on the A-B web-page: <http://www.ab.com/networks/eds/> >Product Name MSR241P

The name of the EDS file is: 0001000C00A30100.eds

The MSR241 operates as a “Group 2 only slave” device and supports UCMM.

The MSR241 is exchanged with the master through a polled, cyclic or change of state connection.

Polled – Masters initiates communication by sending its polled I/O messages to the MSR241 module. The module consumes the message, updates any outputs, and produces a response. The response contains the input data.

Cyclic – allows configuration of the module as an I/O client. The module will produce and consume its I/O cyclically at the rate configured.

Change of state – production occurs when an input changes. If no input change occurs within the expected packet time, a heartbeat production occurs. This heartbeat production tells the scanner module that the MSR241 is alive and ready to communicate. Consumption occurs when data changes and the master produces new output data to the module.

The module produces 4 bytes and consumes 1 byte for outputs.

Byte Definitions

The table below shows the definition of the module

Consumed output byte		
Bit	High	Low
00	K1 energized	K1 de-energized
01	K2 energized	K2 de-energized
02	Reserved	Reserved
03	Reserved	Reserved
04	Reserved	Reserved
05	Reserved	Reserved
06	Reserved	Reserved
07	Reserved	Reserved

Produced Input bytes		
Input byte 1: Configuration and status of MSR210 / MSR211		
Bit	High	Low
00	Device ready	Monitoring active
01	Interrupt of any input	All inputs valid
02	Cross loop detected	No cross loop
03	Automatic reset	Supervised reset
04	Relay-output active (Safety system)	Relay-output not active (Safety system)
05	EDM dynamic	EDM static
06	EDM-loop open	EDM-loop closed
07	Internal fault or no basic module connected	No internal fault and basic module connected

Input-byte2: Status of Inputs of basic module and extension modules 1, 2 and 3		
Bit	High	Low
00	Basic module, input 1 interrupted	Basic module, input 1 valid
01	Basic module, input 2 interrupted	Basic module, input 2 valid
02	Extension module 1, input 1 interrupted	Extension module 1, input 1 valid (or module not existent)
03	Extension module 1, input 2 interrupted	Extension module 1, input 2 valid (or module not existent)
04	Extension module 2, input 1 interrupted	Extension module 2, input 1 valid (or module not existent)
05	Extension module 2, input 2 interrupted	Extension module 2, input 2 valid (or module not existent)
06	Extension module 3, input 1 interrupted	Extension module 3, input 1 valid (or module not existent)
07	Extension module 3, input 2 interrupted	Extension module 3, input 2 valid (or module not existent)

Input-byte3: Status of Inputs of Extension modules 4, 5, 6 and 7		
Bit	High	Low
00	Extension module 4, input 1 interrupted	Extension module 4, input 1 valid (or module not existent)
01	Extension module 4, input 2 interrupted	Extension module 4, input 2 valid (or module not existent)
02	Extension module 5, input 1 interrupted	Extension module 5, input 1 valid (or module not existent)
03	Extension module 5, input 2 interrupted	Extension module 5, input 2 valid (or module not existent)
04	Extension module 6, input 1 interrupted	Extension module 6, input 1 valid (or module not existent)
05	Extension module 6, input 2 interrupted	Extension module 6, input 2 valid (or module not existent)
06	Extension module 7, input 1 interrupted	Extension module 7, input 1 valid (or module not existent)
07	Extension module 7, input 2 interrupted	Extension module 8, input 2 valid (or module not existent)

Input-byte4: Status of Inputs of Extension modules 8, 9 and 10		
Bit	High	Low
00	Extension module 8, input 1 interrupted	Extension module 8, input 1 valid (or module not existent)
01	Extension module 8, input 2 interrupted	Extension module 8, input 2 valid (or module not existent)
02	Extension module 9, input 1 interrupted	Extension module 9, input 1 valid (or module not existent)
03	Extension module 9, input 2 interrupted	Extension module 9, input 2 valid (or module not existent)
04	Extension module 10, input 1 interrupted	Extension module 10, input 1 valid (or module not existent)
05	Extension module 10, input 2 interrupted	Extension module 10, input 2 valid (or module not existent)
06	Reserved	Reserved
07	Reserved	Reserved

Implemented DeviceNet Objects

Mandatory Objects

Object Name	Class
Identify Object	01h
Message Router Object	02h
DeviceNet Object	03h
Connection Object	05h
Acknowledge Handler Object	2Bh
Device Configuration Object	64h

Identity Object, Class 01h

Class Attributes (0)					
ID	Name	Service	Description	Value	Type
1	Revision	Get_Attribute_Single	Object revision 1	1	UINT

Instance Attributes (1)					
ID	Name	Service	Description	Value	Type
1	Vendor ID	Get_Attribute_Single	Identification of each vendor by number	0001h	UINT
2	Device Type	Get_Attribute_Single	Indication of general type of product	000Ch	UINT
3	Product Code	Get_Attribute_Single	This is a code assigned by the Vendor to describe the device	00A3h	UINT
4	Revisions	Get_Attribute_Single	Revision of the item the Identity Object represents	1.31	Array of: USINT USINT
5	Status	Get_Attribute_Single	Summary Status of the Device bit0: Module Owed. A master has allocate the module bit1: reserved bit2: Configured bit3 - 7: reserved bit8: Minor recoverable fault bit9: Minor recoverable fault bit10: Major recoverable fault bit11: Major recoverable fault bit12 - 15: reserved		WORD
6	Serial Number	Get_Attribute_Single	Serial Number of the device		UDINT
7	Product-name	Get_Attribute_Single	Human readable identification	"MSR241P"	SHORT_STRING

Message Router Object, Class 02h

Class Attributes (0)					
ID	Name	Service	Description	Value	Type
1	Revision	Get_Attribute_Single	Object revision 1	1	UINT

DeviceNet Object, Class 03h

Class Attributes (0)					
ID	Name	Service	Description	Value	Type
1	Revision	Get_Attribute_Single	Object revision 2	2	UINT

Instance Attributes (1)					
ID	Name	Service	Description	Def, Min, Max	Type
1	MAC ID	Get_Attribute_Single	Currently used MacID	Switches 0, 63	USINT
2	Baud rate	Get_Attribute_Single	Currently used baudrate 0 = 125kB 1 = 250 kB 2 = 500kB	Switches, 0, 2	USINT
5	Allocation Information	Get_Attribute_Single	Allocation Choice byte Master's MAC ID	N/A	Struct of: BYTE USINT
6	MAC ID Switch Changed	Get_Attribute_Single	The Node Address Switches have changed since the last power-up / reset	0 = no change 1 = Change since last reset or power-up	BOOL
7	Baud Rate Switch Changed	Get_Attribute_Single	The Baud Rate Switches have changed since the last power-up / reset	0 = no change 1 = Change since last reset or power-up	BOOL
8	MAC ID Switch Value	Get_Attribute_Single	Actual value of Node Address Switches	Range: 0-63	USINT
9	Baud Rate Switch Value	Get_Attribute_Single	Actual value of Baud Rate Switches	Range: 0-3	USINT

Assembly Object, Class 04h

Instance Attributes, Instance/Connection Point (64h)					
ID	Name	Service	Description	Value	Type
3	Data	Get_Attribute_Single	Data produced by MSR241 to the master		Array of byte

Instance Attributes (96h)					
ID	Name	Service	Description	Def, Min, Max	Type
3	Data	Get_Attribute_Single	Data consumed by MSR241 from the master		Array of byte

DeviceNet Connection Object, Class 05h

Class Attributes (0)					
ID	Name	Service	Description	Value	Type
1	Revision	Get_Attribute_Single	Object revision 1	1	UINT

Explicit Connection Instance (1, 2, 4 & 10...14)					
Instance 1 = Explicit messaging connection (Predefined in DeviceNet object)					
Instance 2 = Polled connection / COS / Cyclic consuming connection)					
Instance 4 = COS / Cyclic producing connection					
Instance 10 - 14 = Explicit connection (UCMM allocated)					
ID	Name	Service	Description	Value	Type
1	State	Get_Attribute_Single	Object State 0: Non existent 1: Configuring 2: Waiting for Connection ID 3: Established 4: Timed out		USINT
2	Instance Type	Get_Attribute_Single	Explicit messaging connection	0	USINT
3	Transport Class Trigger	Get_Attribute_Single	Server / Transport Class 3	83h	BYTE
4	Produced Cnxn ID	Get_Attribute_Single	CAN ID for transmission		UINT
5	Consumed Cnxn ID	Get_Attribute_Single	CAN ID for reception		UINT
6	Initial Comm Characteristics	Get_Attribute_Single	The message group over which the communication occurs		BYTE
7	Produced Connection Size	Get_Attribute_Single	Maximum number of bytes transmitted across the connection	0100h	UINT
8	Consumed Connection Size	Get_Attribute_Single	Maximum number of bytes received across the connection	0100h	UINT
9	Expected Packet Rate	Get_Attribute_Single Set_Attribute_Single	Timing associated with this connection (2500ms)	09C4h	UINT
C	Watchdog Timeout Action	Get_Attribute_Single	Defines how to handle inactivity / watchdog timeouts 1: Auto delete 3: Deferred delete	1	USINT
D	Produced Connection Path Length	Get_Attribute_Single	Number of bytes in the Produced_connection_path attribute	0	UINT
E	Produced Connection Path	Get_Attribute_Single	No connection path		EPATH
F	Consumed Connection Path Length	Get_Attribute_Single	Number of bytes in the Consumed connection path instance	0	UINT
10	Consumed Connection Path	Get_Attribute_Single	No connection path		EPATH

Polled I/O Connection Instance (2)					
ID	Name	Service	Description	Value	Type
1	State	Get_Attribute_Single	Object State 0: Non existent 1: Configuring 2: Waiting for Connection ID 3: Established 4: Timed out		USINT
2	Instance Type	Get_Attribute_Single	I/O connection	1	USINT
3	Transport Class Trigger	Get_Attribute_Single	Server/Transport Class 0 Server/Transport Class 0	80h 83h	BYTE
4	Produced Cnxn ID	Get_Attribute_Single	CAN ID for transmission		UINT
5	Consumed Cnxn ID	Get_Attribute_Single	CAN ID for reception		UINT
6	Initial Comm Characteristics	Get_Attribute_Single	Produces over message group 1 Consumes over message group 2 Does not produce Consumes over message group 2	01h F1h	BYTE
7	Produced Connection Size	Get_Attribute_Single	Maximum number of bytes transmitted across the connection	4	UINT
8	Consumed Connection Size	Get_Attribute_Single	Maximum number of bytes received across the connection	1	UINT
9	Expected Packet Rate	Get_Attribute_Single Set_Attribute_Single	Timing associated with this connection	0	UINT
C	Watchdog Timeout Action	Get_Attribute_Single Set_Attribute_Single	0: Transmission timeout	0	USINT
D	Produced Connection Path Length	Get_Attribute_Single	Number of bytes in the Produced_connection_path attribute	0007h (Polled) 0000h (COS / Cyclic)	UINT
E	Produced Connection Path	Get_Attribute_Single	Application obj. producing data on this connection	20h, 04h, 25h, 64h, 00h, 30h, 03h	EPATH
F	Consumed Connection Path Length	Get_Attribute_Single	Number of bytes in the Consumed_connection_path attribute	7	UINT
10	Consumed Connection Path	Get_Attribute_Single	Specifies the application object(s) that are to receive the data consumed by this connection object	20h, 04h, 25h, 96h, 00h, 30h, 03h	EPATH
11	Production Inhibit Time	Get_Attribute_Single	Minimum time between new data production	0	UINT

Change of state / Cyclic (4) (Acknowledged)					
ID	Name	Service	Description	Value	Type
1	State	Get_Attribute_Single	Object State 0: Non existent 1: Configuring 2: Waiting for Connection ID 3: Established 4: Timed out		USINT
2	Instance Type	Get_Attribute_Single	I/O connection	1	USINT
3	Transport Class Trigger	Get_Attribute_Single	Defines behavior of the connection	00h = Cyclic 03h = Cyclic + ACK 10h = COS 13 = COS + ACK	BYTE
4	Produced Cnxn ID	Get_Attribute_Single	CAN ID for transmission		UINT
5	Consumed Cnxn ID	Get_Attribute_Single	CAN ID for reception		UINT
6	Initial Comm Characteristics	Get_Attribute_Single	Produces over message group 1, Does not consume. Produces over message group 1, Consumes over message group 2	0Fh 01h	BYTE
7	Produced Connection Size	Get_Attribute_Single	Number of bytes transmitted across the connection	4	UINT
8	Consumed Connection Size	Get_Attribute_Single	Consumes o Byte on this connection	0	UINT
9	Expected Packet Rate	Get_Attribute_Single Set_Attribute_Single	Timing associated with this connection	0	UINT
C	Watchdog Timeout Action	Get_Attribute_Single	0: Transmission timeout	0	USINT
D	Produced Connection Path Length	Get_Attribute_Single	Number of bytes in the Produced connection path attribute	0007h	UINT
E	Produced Connection Path	Get_Attribute_Single	Assembly Object, Instance 100, Attribute 3 is producing the data	20h, 04h, 25h, 64h, 00h, 30h, 03h	EPATH
F	Consumed Connection Path Length	Get_Attribute_Single	Number of bytes in the Consumed connection path instance	0007h (no ACK) 0005h (ACK)	UINT
10	Consumed Connection Path	Get_Attribute_Single	Acknowledge Handler Object, Instance 1	20h, 2Bh, 25h, 01h, 00h	EPATH
11	Production Inhibit Time	Get_Attribute_Single	Minimum time between new data production	0	UINT

Acknowledge Handler Object, Class 2Bh

Class Attributes (0)					
ID	Name	Service	Description	Value	Type
1	Revision	Get_Attribute_Single	Revision 1	1	UINT

Instance Attributes (1)					
ID	Name	Service	Description	Value	Type
1	Acknowledge Timer	Get_Attribute_Single Set_Attribute_Single	Time (in ms) to wait for acknowledge before re-sending	16	UINT
2	Retry Limit	Get_Attribute_Single Set_Attribute_Single	Number of ACK timeouts before retry reached event	1	USINT
3	Producing Connection Instance	Get_Attribute_Single	Connection instance, which contains the path of the producing I/O application object, which will be notified of ACK Handler events	4	UINT

Device Configuration Object, Class 64h

Instance Attributes (1)					
ID	Name	Service	Description	Def, Min, Max	Type
1	Number of extension modules	Get_Attribute_Single	Number of input extension modules of the safety system MSR200	0, 0, 10	BYTE

Troubleshoot with Indicators

The MSR241 has the following indicators:

- Module status indicator
- Network status indicator
- Output status indicators K1 and K2

Module Status Indicator	
Indication	Status
Off	Device not powered
Green	Device operational
Flashing green	Device needs commissioning due to missing or incorrect configuration, MSR241 not connected to the Safety system MSR210
Red	Unrecoverable fault
Flashing red	Minor fault recoverable, baud rate switches are invalid, MAC ID or Baud Rate switches are changed while on line or since reset / power-up

Network Status Indicator	
Indication	Status
Off	Device not powered / Not online
Green	Link OK, On line, Connected
Flashing green	On line, Not connected
Red	Critical link failure
Flashing red	Connection timeout

Output Status Indicator K1	
Indication	Status
Off	K1 de-energized
Green	K1 energized

Output Status Indicator K2	
Indication	Status
Off	K2 de-energized
Green	K2 energized

Specifications

Output specification K1, K2	
Nominal switching capacity (resistive load)	2A 30V DC
Max. switching power (resistive load)	60W
Max. switching voltage	220V DC
Max. switching current	2A
Min. switching capacity	10 μ A 10mV DC
UL/CSA rating	2A 30V DC 0.3A 110V DC 0.5A 125V DC

General Specifications	
Indicators	Module Status red/green Network Status red/green Output Status K1, K2 green
Communication rate	125 kBaud, 250kBaud, 500 kBaud
Max. length of fieldbus segment	100m ... 500m (depends on baud rate / on the cable)
Isolation Output to DeviceNet Output to Output	500V ac/60s 500V ac/60s
DeviceNet Power Voltage Current	11 – 25V dc 170mA maximum
Temperature	-5°C – 50°C