1. LS172

1.1 General Information

With the Logic Scanner LS172, B&R Automation Runtime™ can access two CAN lines.

The LS172 module is available in two versions.

Module	Description
LS172.4	The LS172.4 is an ISA half size module. The module is ISA Plug & Play capable.
LS172.6	The LS172.6 is a PCI half size module. The module is Plug & Play capable. Additionally, the module has 256 KByte SRAM onboard, which can be used by B&R Automation Runtime™ for remanent process variables.

Table 1: LS172 differences between both versions

Area of Use

- CAN I/O master
- Connection to CAN networks

Features

Two FULL CAN Interfaces:
- Individually electrically isolated
- Transfer rates can be individually configured (max. 500 kBit/s)
- Node number switch on the module

Send and receive buffer
- Reduces the interrupt load on the PC
- Local object buffering
- "High water mark" and "timeout" parameters can be set for both interfaces

Diagnostics Support:
- Automatic baud rate recognition
- Recognizes BusOff and error telegrams

B&R Automation Runtime™ Software Support:
- Supports B&R Automation Net™
- Supports CAN I/O master functionality
- Uses standard function blocks for CAN

Chapter 4
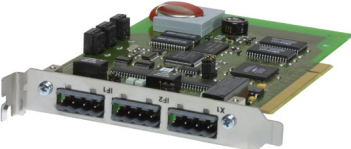Communication Modules

1.2 Order Data

Model Number	Short Description	Image
5LS172.4	Logic Scanner 2x CAN, ISA half size module, max. 500 kBaud, object buffer in send and receive direction, CAN: electrically isolated	
5LS172.6	Logic Scanner 2x CAN, ISA half size module, max. 500 kBaud, object buffer in send and receive direction, 256 KByte SRAM (Automation Runtime), CAN: electrically isolated	5LS172.4
	Accessories	
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm connection cable (TB704)	5LS172.6

Table 2: LS172 order data

1.3 Technical Data

Product ID	LS172.4	LS172.6
General Information		
C-UL-US Listed	Yes	
Design	Standard ISA half size module, ISA Plug & Play	Standard PCI half size module, ISA Plug & Play
Installation in B&R PROVIT 2000 Industrial PCs B&R PROVIT 5000 Industrial PCs Desktop PCs	Yes Yes Yes	No Yes Yes
Interfaces	2 x CAN	
Power Consumption	Max. 2.3 W	Max. 2.4 W
SRAM		
Memory Size	---	256 KByte
Data Buffering Backup Battery Battery Monitoring Buffer Duration Change Interval	--- --- --- ---	Lithium battery 3 V / 950 mAh Yes At least 3 years Every 4 years[1]
Ready Relay		
Contact for Ready Relay Design Switching Voltage Continuous Current	N.O. and N.C. Max. 30 VDC Max. 10 A	

Table 3: LS172 technical data

Product ID	LS172.4	LS172.6
IF1 and IF2 Application Interface		
Type	CAN	
Controller	Controller SJA 1000	
Design	2 x 4 pin multipoint connector	

Electrical Isolation
   To the PC
   Between Interfaces
	Yes
	Yes	

Maximum Distance	1,000 m	

Maximum Baud Rate
   Bus Length ≤60 m
   Bus Length ≤200 m
   Bus Length ≤1,000 m
	500 kBit/s
	250 kBit/s
	50 kBit/s	

Network Capable	Yes	
Bus Termination Resistor	Can be configured using the jumper on the module	

Table 3: LS172 technical data (cont.)

1) The change interval refers to the average life span and operating conditions and are recommended by B&R. This does not correspond to the maximum buffer duration.

1.4 Dimensions

Logic Scanner LS172.4

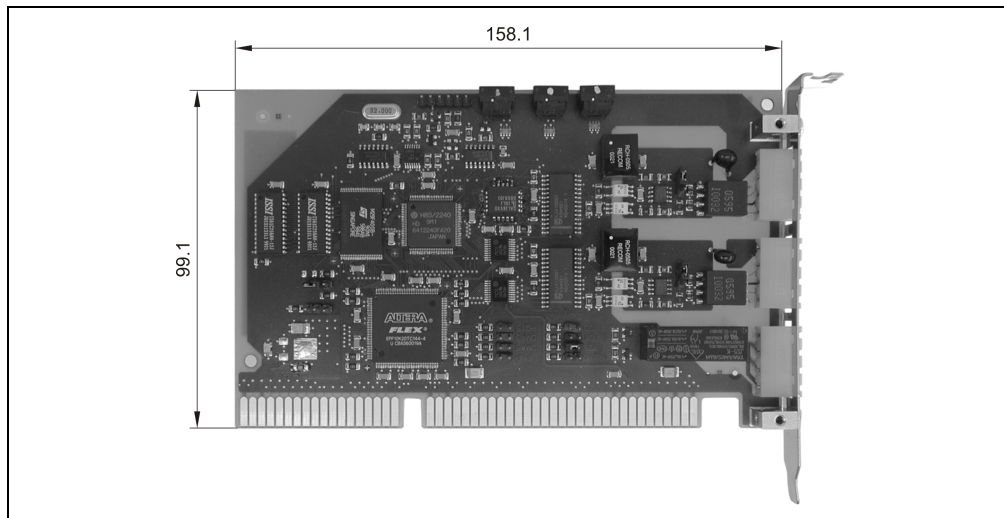The LS172.4 Logic Scanner module is designed in such a way that an ISA adapter can be operated in the IPC2001.

Figure 1: LS172 dimensions for LS172.4 Logic Scanner

Logic Scanner LS172.6

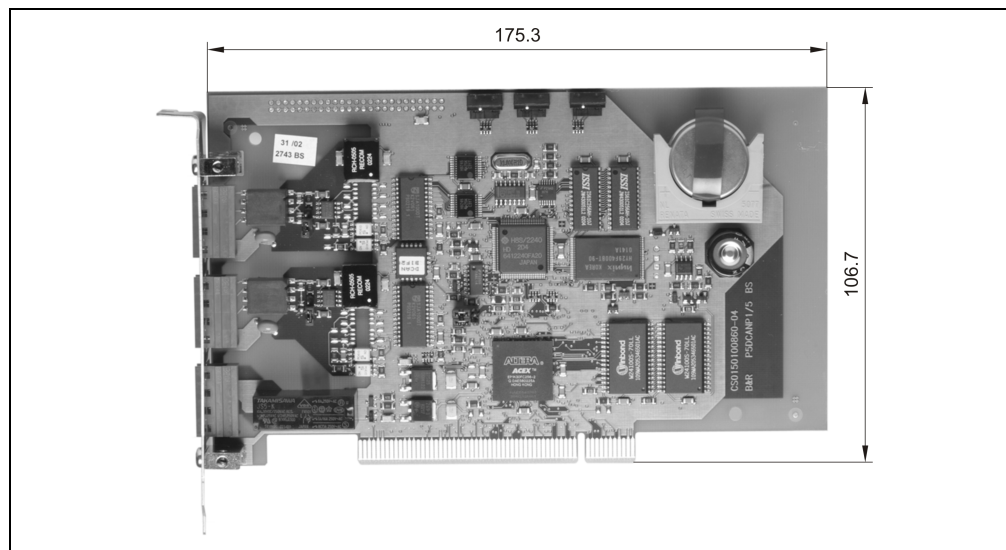The LS172.6 Logic Scanner module corresponds to the dimensions of B&R half size cards.

Figure 2: LS172 dimensions for LS172.6 Logic Scanner

1.5 Operational and Connection Elements
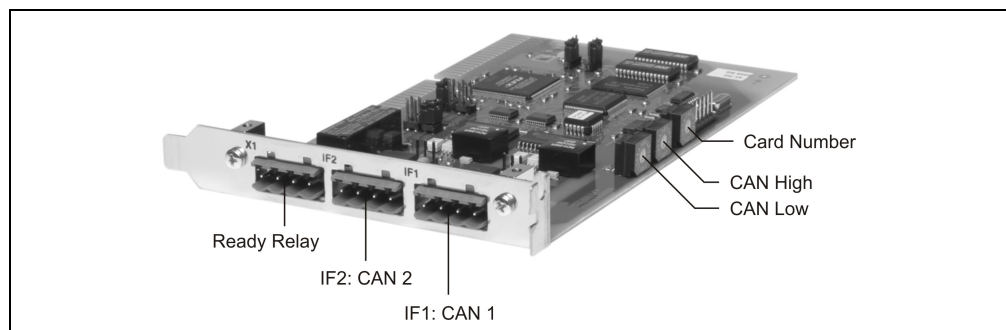
Logic Scanner LS172.4

Figure 3: LS172 operational and connection elements for Logic Scanner LS172.4
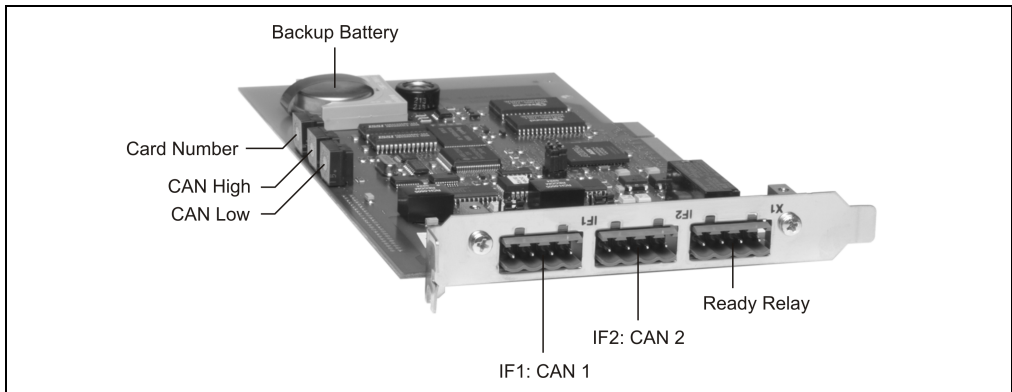
Logic Scanner LS172.6

Figure 4: LS172 operational and connection elements for Logic Scanner LS172.6

1.6 CAN

1.6.1 CAN Node Number Switch

The node number for the first CAN interface (IF1) is set with the two hex switches. The following formula is used to set the second CAN interface (IF2):

Node number CAN 2 (IF2) = node number CAN 1 (IF1) + 1

CAN node numbers can also be set using the software.

1.6.2 CAN Interfaces

The bus termination resistance can be turned on or off using jumpers (see section 1.10 "Jumpers", on page 7).
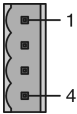
Interface	Description	Pin Assignments		
Application Interface CAN 1 4 4 pin multipoint connector	The electrically isolated CAN interface is a 4 pin multipoint connector. Max. baud rate: Bus length ≤60 m: 500 kBit/s Bus length ≤200 m: 250 kBit/s Bus length ≤1000 m: 50 kBit/s	**Terminal**	**CAN**	
		1	CAN_H	CAN High
		2	CAN⊥	CAN Ground
		3	CAN_L	CAN Low
		4	SHLD	Shield

Table 4: LS172 interfaces CAN 1 and CAN 2 (IF1 and IF2)

1.7 Ready Relay

The LS172 module is equipped with a ready relay. When activated using software, the driver software for the PC must cyclically deliver a specific command using the CAN FIFO.

The relay goes into idle state:

• If the command stays off for a defined amount of time.

• When the PC is reset.

The ready relay can be integrated in the control system, in order to recognize an error status on the Soft PLC.
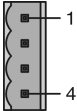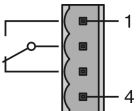
Interface	Terminal	Description	Internal Wiring
Ready Relay	1	Normally open contact	
	2	Common connection	
	3	Normally closed contact	
	4	Not connected	
4 pin multipoint connector			

Table 5: LS172 ready relay

1.8 Card Number Switch

The one digit card number ($1 - $F) is configured using the card number switch. This number is used to for module differentiation, in case several LS172 are used in a system.

1.9 Backup Battery

The LS172.6 has 256 KByte SRAM onboard. The module is equipped with a backup battery for data buffering.

1.10 Jumpers

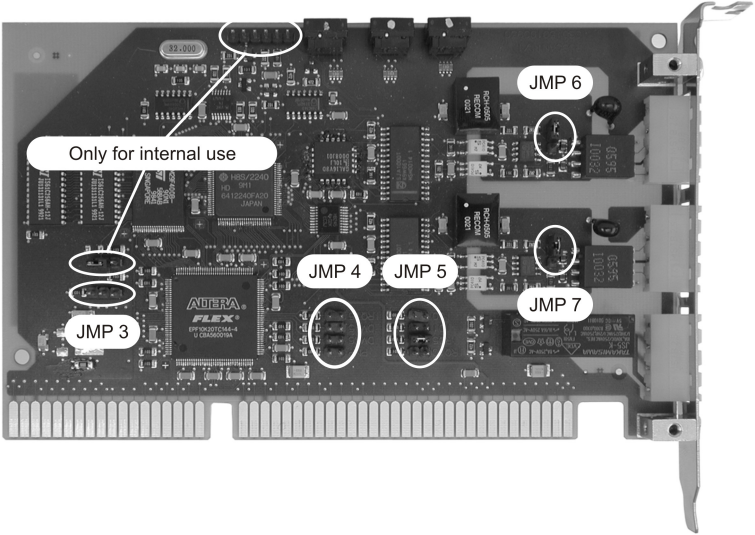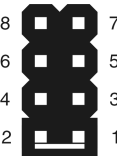The LS172 is configured using a jumper.

1.10.1 LS172.4

Jumpers for the LS172.4

JMP 3	Pin	Description
1 2 3	1 - 2	SW upgrade is locked.
	2 - 3	SW upgrade is released.

JMP 4	Pin	Description
8 □ □ 7 6 □ □ 5 4 □ □ 3 2 □ □ 1	1 - 2	Plug and Play is activated: That means that the remaining plug pairs for jumpers 4 and 5 are deactivated.
	3 - 4	Not used.
	5 - 6	Not used.
	7 - 8	Interrupt 15 is selected.

Table 6: LS172 jumpers for the LS172.4
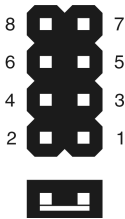
JMP 5	Pin	Description			
	1 - 2	Interrupt 10 is selected.			
	3 - 4	Interrupt 5 is selected.			
	5 - 6 / 7 - 8	Selects the I/O address range.			
		Pin 5 - 6	**Pin 7 -8**	**I/O Address Range**	
		0	0	$250 - $25F	
		0	1	$290 - $29F	
		1	0	$350 - $35F	
		1	1	$390 - $39F	

JMP 6	Pin	Description
	1 - 2	CAN 1: Terminating resistor on
	2 - 3	CAN 1: Terminating resistor open

JMP 7	Pin	Description
	1 - 2	CAN 2: Terminating resistor on
	2 - 3	CAN 2: Terminating resistor open

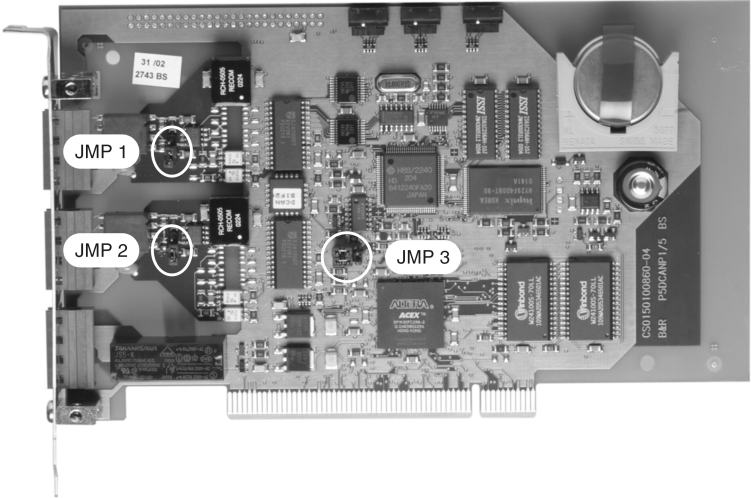Table 6: LS172 jumpers for the LS172.4 (cont.)

1.10.2 LS172.6

Jumpers for the LS172.6

JMP 1	Row	Pin	Description
	---	1 - 2	CAN 1: Terminating resistor on
		2 - 3	CAN 1: Terminating resistor open

JMP 2	Row	Pin	Description
	---	1 - 2	CAN 2: Terminating resistor on
		2 - 3	CAN 2: Terminating resistor open

JMP 3	Row	Pin	Description
	SW Upgrade	1 - 2	SW upgrade is released.
		2 - 3	SW upgrade is locked.
	Internal only	1 - 2	The second row is intended only for internal use. Pins 1 and 2 must be bypassed.

Table 7: LS172 jumpers for the LS172.6

1.11 B&R Automation Runtime™

B&R Automation Runtime™ must be installed on the IPC or the desktop PC. The following runtime systems can be installed depending on the LS172 versions:

Logic Scanner	B&R Automation Runtime™
LS172.4	AR010, AR102, AR105
LS172.6	AR010, AR105

Table 8: LS172 B&R Automation Runtime™

1.12 SRAM

The LS172.6 PCI version is equipped with 256 KByte SRAM. This memory can be used by B&R Automation Runtime™ for remanent process variables.