

6.2.6 DSQC 652, Digital I/O

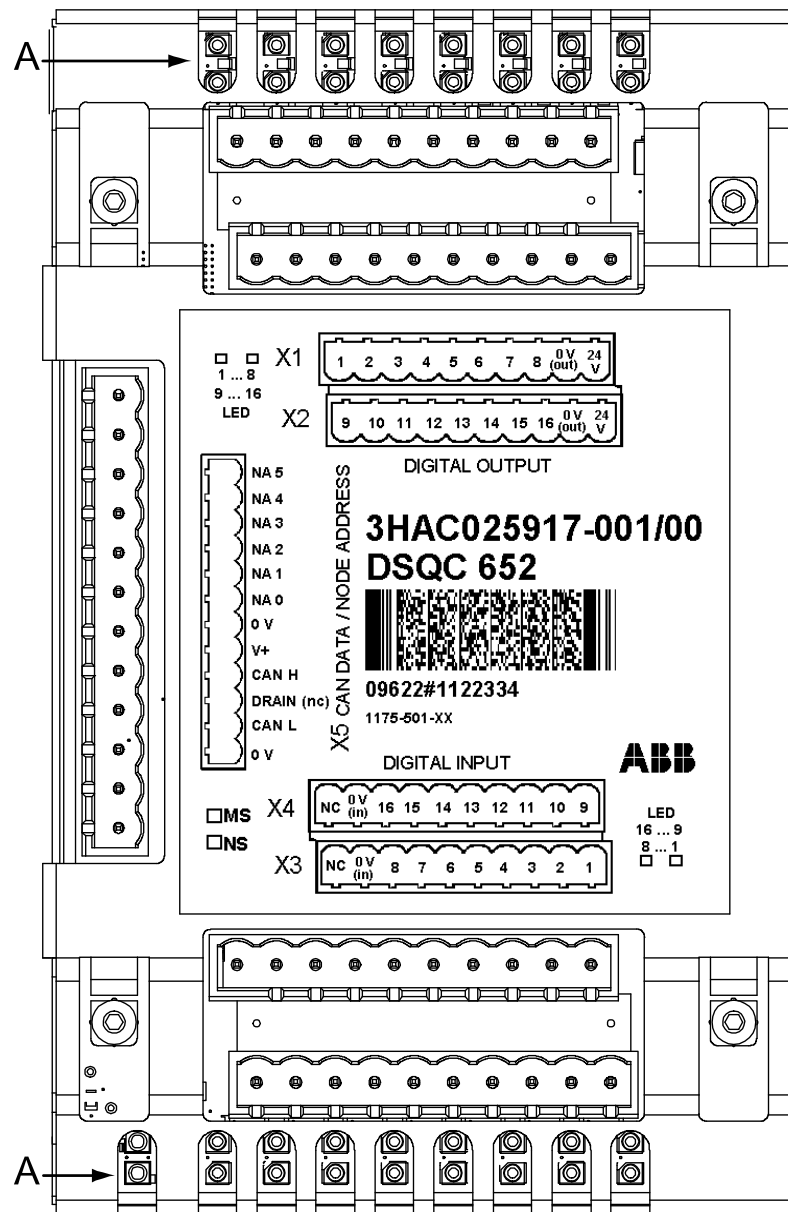
Description

The DSQC 652 is a circuit board normally mounted inside the robot controller. As an option, it may also be mounted in an external I/O module.

The device handles digital input and output signals between the robot system and any external systems.

Illustration of DSQC 652

The following figure shows the DSQC 652 board:



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Parts

Item	Description
A	Status LEDs
X1	Digital outputs
X2	Digital outputs
X3	Digital inputs
X4	Digital inputs
X5	DeviceNet connector

Facts, DSQC 652

This section specifies a number of facts applicable to the DSQC 652. Unless stated otherwise, the data applies to the standard version.

Technical data

Digital inputs	Number of digital inputs: 16 Rated voltage: • 24 VDC Input voltage range: • "1" ---> 15 to 35 V • "0" ---> -35 to 5 V Input current at rated voltage: • Typical ---> 5 mA (approx) Switch-over level: • Typical --->12V (approx) Delay (with default filtering): • Typical --->5 ms • minimum --->4 ms • maximum --->6ms Power dissipation or channel at rated voltage: • Typical --->150 mW (approx)
Digital outputs	Number of digital outputs: 16 Short-circuit protected outputs with current limitation and thermal overload protection. Miswiring protection +35V to – 35V connected to output. Rated voltage: • 24 VDC Voltage drop over output: • maximum ---> 0.5V with 500mA Rated output current: • 500 mA/channel Current limit: • Typical ---> 1.4A Leakage current: • maximum ---> 0.1 mA Delay output: • maximum ---> 0.5 ms
Supply voltage	24 VDC
Supply source	24 V I/O or separate external supply

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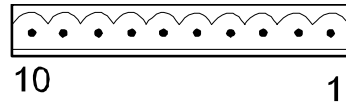
External supply for digital outputs Reverse polarity protection.	Voltage: • 19 - 35 V
SW connections	Support for the following connections: • Polled • Change-Of-State • Change-Of-State with acknowledge suppression • Cyclic • Cyclic with acknowledge suppression For descriptions of the different types of I/O connections, see I/O messages - connection types on page 15 .
BaudRate	Autodetect; the device will detect the baud rate automatically.  Note When the master baud rate is changed disconnect the power to the device(s) before the system is restarted, reconnect the power when the master is up and running. This is required for the device(s) to be able to establish a new connection with the master.

Device setup

The device must be given an address, and setup parameters must be entered into the system.

Connector X1

If supply voltage supervision is required, a bridge connection can be made to an optional digital input. The supervision instruction must be written in the RAPID program.



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The following table shows the connections to connector X1:

Device function	Signal name	X1 pin
Optically isolated output	Out ch 1	1
Optically isolated output	Out ch 2	2
Optically isolated output	Out ch 3	3
Optically isolated output	Out ch 4	4
Optically isolated output	Out ch 5	5
Optically isolated output	Out ch 6	6
Optically isolated output	Out ch 7	7
Optically isolated output	Out ch 8	8
Optically isolated output	0 V for outputs	9
Optically isolated output	24 V for outputs	10

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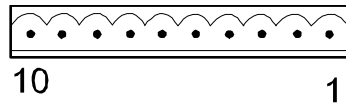
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Connector X2

If supply voltage supervision is required, a bridge connection can be made to an optional digital input. The supervision instruction must be written in the RAPID program.

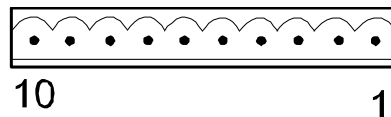


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The following table shows the connections to connector X2:

Device function	Signal name	X2 pin
Optically isolated output	Out ch 9	1
Optically isolated output	Out ch 10	2
Optically isolated output	Out ch 11	3
Optically isolated output	Out ch 12	4
Optically isolated output	Out ch 13	5
Optically isolated output	Out ch 14	6
Optically isolated output	Out ch 15	7
Optically isolated output	Out ch 16	8
Optically isolated output	0 V for outputs	9
Optically isolated output	24 V for outputs	10

Connector X3



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The following table shows the connections to connector X3:

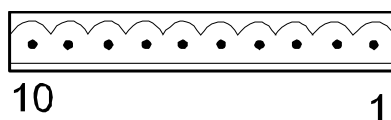
Device function	Signal name	X3 pin
Optically isolated input	In ch 1	1
Optically isolated input	In ch 2	2
Optically isolated input	In ch 3	3
Optically isolated input	In ch 4	4
Optically isolated input	In ch 5	5
Optically isolated input	In ch 6	6
Optically isolated input	In ch 7	7
Optically isolated input	In ch 8	8
Optically isolated input	0 V for inputs	9
Optically isolated input	Not used	10

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The input current is 5.5 mA (at 24 V) on the digital inputs. A capacitor connected to ground, to prevent disturbances, causes a short rush of current when setting the input.

When connecting outputs, sensitive to pre-oscillation current, a series resistor (100 Ohms) may be used.

Connector X4



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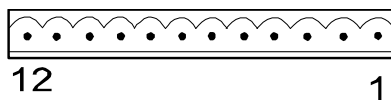
The following table shows the connections to connector X4:

Device function	Signal name	X4 pin
Optically isolated input	In ch 9	1
Optically isolated input	In ch 10	2
Optically isolated input	In ch 11	3
Optically isolated input	In ch 12	4
Optically isolated input	In ch 13	5
Optically isolated input	In ch 14	6
Optically isolated input	In ch 15	7
Optically isolated input	In ch 16	8
Optically isolated input	0 V for inputs	9
Optically isolated input	Not used	10

The input current is 5.5 mA (at 24 V) on the digital inputs. A capacitor connected to ground, to prevent disturbances, causes a short rush of current when setting the input.

When connecting outputs, sensitive to pre-oscillation current, a series resistor (100 ohms) may be used.

Connector X5



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Connector X5 is a DeviceNet connector specified in section [Setting DeviceNet network ID on page 54](#).

LEDs

The significance of the LEDs are specified in section [DeviceNet network and I/O board status LED description on page 49](#).

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Input map

The following figure shows the digital input mapping.

Input byte	Bit								Bit range
	7	6	5	4	3	2	1	0	
0	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1	0-7
1	DI 16	DI 15	DI 14	DI 13	DI 12	DI 11	DI 10	DI 9	8-15

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Output map

The following figure shows the digital output mapping.

Output byte	Bit								Bit range
	7	6	5	4	3	2	1	0	
0	DO 8	DO 7	DO 6	DO 5	DO 4	DO 3	DO 2	DO 1	0-7
1	DO 16	DO 15	DO 14	DO 13	DO 12	DO 11	DO 10	DO 9	8-15

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Electronic Data Sheet

The Electronic Data Sheet for the DeviceNet Master/Slave devices, matching the configuration of DSQC 652, *dsqc652.eds*, can be obtained from the PC or the IRC5 controller. For more information see [EDS file on page 29](#).