

Product data sheet

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Date: March, 2010

FieldQ

Smart - Control Modules

QC31: DeviceNet

Description:

This FieldQ Control Module offers an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality and communicates through the DeviceNet™ protocol.

Construction

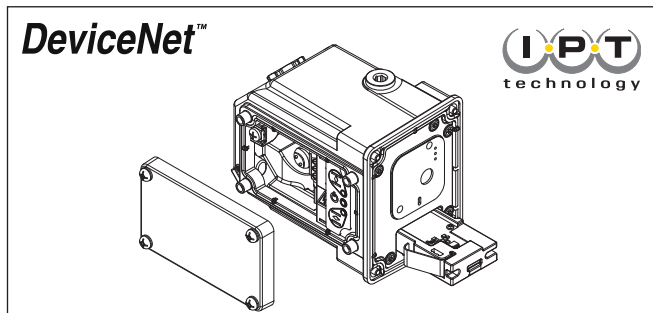
The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside are terminals available for connecting DeviceNet™ wiring. Two cable entries are available for this purpose.

Features

- ODVA DeviceNet™ digital communication.
- **Supports both single and double acting actuators.**
- **One entry for all wiring** (control and feedback), using DeviceNet cabling.
- **IPT-technology** (Intelligent Position Tracking).
- **Automatic initialization** for easy setup of the actuator. **Pressing 4 seconds** simultaneously the "Open" and "Closed" reassignment buttons starts auto-initialization procedure and sets automatically the feedback limit switches.
- **Readjustable or Reversible position feedback** using the reassignment buttons.
- **Three indication LED's** for "Status", "Open" and "Closed" position. Status LED indicates:

Initialization procedure running	Blinking
Successful initialization procedure	LED is on
No or failed initialization	Flashing

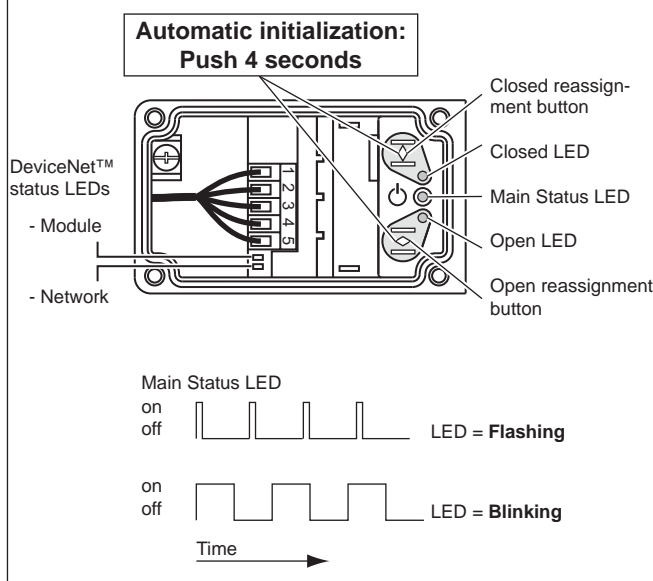
- Control Module **is easily plugged in** the Pneumatic Module.
- Modular functionality for **easy update** towards present and future bus systems.
- **The power supply and all inputs and outputs are galvanic isolated** which offers greater flexibility for systems connection.



General specifications

Material housing	: Aluminium alloy
Electrical connections	: Internal terminal strip
	: Optional quick connector
Cable entries	: 2x M20x1.5 or 2x 1/2"NPT
Enclosure	: IP65 / NEMA 4X
Finish	: Polyester non-TGIC based powder coating.
Operating media	: Air or inert gasses, filtered at 50 micron.
Temperature	: -20° to +80°C / -4° to +176°F
Dimensions	: See 1.603.01 metric
	: See 1.603.04 imperial/UNC
	: See 1.603.02 DIN 3337

FieldQ Button board and wiring compartment



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Communication Protocol:

General purpose discrete I/O, Class 7 with objects

Table 1 Protocol details and specifications

Common and DeviceNet specific Objects	Class ID	Instance ID(s)
Identity Object	1	1
Message Router Object	2	1
DeviceNet Object	3	1
Assembly Object	4	100, 101
Connection Object	5	1, 2, 4, 5, 6, 7
Discrete Input Point Object	8	100, 101
Discrete Output Point Object	9	100
Analog Input Point Object	10	100
Controller Object	100	1
Monitor Object	101	1
Device Conformance	ODVA DeviceNet Spec Vol.I Rev 3.7 & Vol. III Rev 1.8	
Communications	Prefined Master/Slave Connection Set, Group 2 Server.	
I/O Protocols	Polled I/O, Change of State (COS), Cyclic, Explicit and Dynamic Explicit connection objects.	
Baud Rate	Default set to "Auto-baud Can be set to 125, 250 or 500kb/sec	
Refresh rate	400 ms (2.5 kHz) minimum	
DeviceNet Connection	5 pole terminal, or quick connector	
Voltage isolation	None	
Nominal Power	120mA @ 11VDC 75mA @ 25VDC	
Maximum Power	2.0 W	

Options

Manual Control

- Can be added as kit or factory option in 2 versions, "Push button" or a "Push and lock" button.

Glands and plugs

- FieldQ Control Modules can be shipped with plastic or metal glands (M20x1.5 or 1/2"NPT) and rated IP65 or higher.

Hazardous area executions:

- The DeviceNet™ Control Module QC31 is available with optional Non-Incendive or Non-Sparking approvals as listed below:
 - FM : Non-Incendive, Class I, II, III, Div.2, Groups ABCDEFG, T4, Type 4X/IP65
: Class I, Zone 2, IIC T4
: Certificate : 3017626
 - CSA : Non Incendive: Class I, II, III, Div.2, Groups ABCDEFG, T4
: Ex nA II T4 (Class I, Zone 2)
: DIP A22 TA 90°C
: Certificate : 1477696

Ambient temperature:

T4 @ Ta = : -20°C...+80°C (-4°F...176°F)

DeviceNet™ terminal wiring connections:

Detailed Non-Incendive / Non-sparking wiring instructions, will be shipped with the product, see control drawing: see Installation Guide : DOC.IG.QC31.1

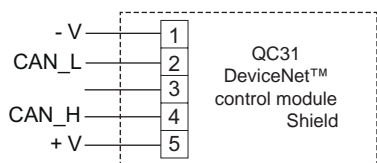
Wiring dimensions

Cable range : 0.2 - 2.5mm² or 30-12 AWG

Quick connector:

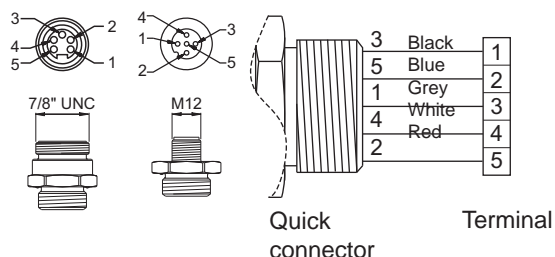
- The DeviceNet™ Module can optionally be equipped with prewired quick connectors. Two versions are available: 7/8" or M12 (male chassis part)
- Quick connectors, as shown below, are excluded for non-Incendive or non-sparking use in hazardous area's classified as Zone 2 or 22 or CI I, II, III, Div. 2.

DeviceNet™ terminal wiring connections:



Quick connector pinouts:

(male chassis part)



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DeviceNet™ status LEDs

Status feedback is provided according to the DeviceNet™ standard. For more detailed information on button board functionality and LED indications, see Installation Guide : DOC.IG.QC31.1

Diagnostics on QC31 DeviceNet™ Control module

The FieldQ Control Module with DeviceNet™ communication has diagnostic capabilities. These process parameters can give information about communication condition, valve and/or actuator unit. It enables to predict failures in advance and makes maintenance easier to schedule.

Monitor Object

The QC31 DeviceNet™ Control module presents its diagnostics through the Instance Attributes of the Monitor Object, Class ID 101 (65_{hex}) as shown in table 2 and 3.

Table 2 Monitor Object Instance Attributes

Attribute ID	Name
1	Device Status
2	Zero power condition: 1 = Open, 0 = Close
3	Recognize unit status
4	Position
5	Time in position
6	Open travel timer
7	Close travel timer
8	Cycle counter
9	Average Open travel timer
10	Average Close travel timer
11	Selected FieldQ command to open and close

Table 3 Device Status Attributes

Bit	Description
0	Internal communications lost (set by DeviceNet firmware)
1	GMR_error
2	Temp_sensor_error
3	System_temp_exceeded
4	Software_error
5	travel_deviation
6	Shutdown_set
7	Unknown error
8	Init_bad_repeatability
9	Init_running
10	Init_stopped
11	Init_range_error
12	Init_timed_out
13	n/a
14	Init_ok
15	Init_default



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