

Discrete Output Module: High Density, Isolated

20 Output Channels with User-configurable Default Output States







DESCRIPTION

The MAQ®20-DODC20SK module has 20 isolated discrete output channels that can switch up to 60VDC signals and sink up to 3A of current. Channels can be switched individually or in block format. User-configurable default output states which are set upon power up or module reset ensure fail-safe operation for critical applications. Logic polarity can be user defined as standard or inverted. The isolated field outputs are designed for harsh industrial environments and have fast switching times. Field output connections are made through high-density spring cage terminal blocks.

Output-to-bus isolation is a robust 1500Vrms and each individual channel is protected up to 60VDC continuous overload in case of inadvertent wiring errors. 150Vrms channel-to-channel isolation gives the module the ability to control equipment with or without common signal grounds or different pieces of equipment with multiple reference potentials.

The high channel count within the narrow module package gives exceptional functionality while preserving valuable mounting space. The high density minimizes cost per channel resulting in economical control solutions.

All MAQ20 modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise commonly present in heavy industrial environments.

FEATURES

- 20 Isolated Discrete Output Channels with User-configurable Default Output States
- Channels Switch up to 60VDC Signals and Sink up to 3A Current
- Channels Switched Individually or in Blocks
- 1500Vrms Output-to-Bus Isolation
- 150Vrms Channel-to-Channel Isolation
- Each Channel Protected up to 60VDC Continuous Overload

- · User-defined Logic Polarity
- Fast Switching Times
- Field Output Connections Use Spring Cage Terminal Blocks
- Most Affordable Price per Channel
- Heavy Industrial CE Compliant
- UL/cUL (Class I, Div 2, Groups A, B, C, D) File E232858
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863

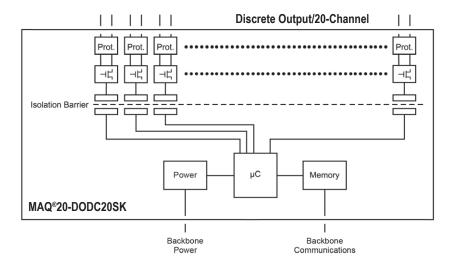
BENEFITS

- · Highly Compact
- · Low Cost per Channel
- Modular

- On-vehicle/-mobile Use Possible (Wide Power Supply Voltage)
- Open Software Platform Options
- Easy and Fast Setup/Installation

APPLICATIONS

- Process Control
- Factory Measurement and Control
- Machine Automation
- Military and Aerospace
- Scientific Measurement and Monitoring
- Battery Management



MAQ20-DODC20SK Discrete Output Voltage Module Block Diagram



Specifications Typical* at T_A =+25°C and +24VDC system power

| Module Description MAQ20-DODC20SK 10-60VDC-output at 3A (max) per Channel Number of Channels Output Configuration 20 Open Drain MOSFET Switching Characteristics Turn-on/Turn-off Time Output Load (Combined load, all channels) T _A = +25°C T _A = +85°C 1ms /1ms Output Protection Continuous Transient 60VDC (max) ANSI/IEEE C37.90.1 CMV Channel-to-Bus Channel-to-channel Transient 1500Vrms, 1 Minute 150Vrms, 212 V _{PEAK} ANSI/IEEE C37.90.1 Output Functions Logic Selection Block Write Default Relay State on Power Up/Reset Standard / Inverted 20 Channel User-configurable Update Rate Power Supply Current 1300 Ch/s net, 65 Ch/s at 20-ch Simultaneous 30mA Dimensions (h)x(w)x(d) 3.27" x 4.51" x 0.60" (83.1mm x 114.6mm x 15.3mm) Environmental Operating Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT -40°C to +85°C -40°C to | - " | | | |
|--|--|--|--|--|
| Number of Channels Output Configuration Switching Characteristics Turn-on/Turn-off Time Output Load (Combined load, all channels) T _A = +25°C T _A = +85°C Output Protection Continuous Transient CMV Channel-to-Bus Channel-to-channel Transient Output Functions Logic Selection Block Write Default Relay State on Power Up/Reset Update Rate Power Supply Current Dimensions (h)x(w)x(d) Environmental Operating Temperature Storage Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-2 RF ESD, EFT Certifications Uutuat Configuration 20 Open Drain MOSFET Ams /1ms 1ms /1ms 1vis /1m | Module | Description | | |
| Output Configuration Switching Characteristics Turn-on/Turn-off Time Output Load (Combined load, all channels) TA = +25°C TA = +85°C Output Protection Continuous Transient CMV Channel-to-Bus Channel-to-channel Transient Output Functions Logic Selection Block Write Default Relay State on Power Up/Reset Update Rate Power Supply Current Dimensions (h)x(w)x(d) Environmental Operating Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-2 RF ESD, EFT Certifications Sund ANSI/IEEE C37.90.1 Output Functions 1500Vrms, 212 V _{PEAK} ANSI/IEEE C37.90.1 | MAQ20-DODC20SK | 10-60VDC-output at 3A (max) per Channel | | |
| Turn-on/Turn-off Time Output Load (Combined load, all channels) $T_A = +25^{\circ}C$ $T_A = +85^{\circ}C$ $T_A = +8$ | | · | | |
| Continuous Transient CMV Channel-to-Bus Channel-to-channel Transient ANSI/IEEE C37.90.1 Output Functions Logic Selection Block Write Default Relay State on Power Up/Reset Update Rate Power Supply Current Dimensions (h)x(w)x(d) Chysnet, 65 Ch/s at 20-ch Simultaneous 30mA Dimensions (h)x(w)x(d) Chysnet, 65 Ch/s at 20-ch Simultaneous 30mA Dimensions (h)x(w)x(d) Chysnet, 65 Ch/s at 20-ch Simultaneous 30mA Dimensions (h)x(w)x(d) Chysnet Channel Cohannel C | Turn-on/Turn-off Time Output Load (Combined load, all channels) T _A = +25°C | 30A | | |
| Logic Selection Block Write Default Relay State on Power Up/Reset Update Rate Power Supply Current Dimensions (h)x(w)x(d) Environmental Operating Temperature Relative Humidity Emissions, EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT Certifications Standard / Inverted 20 Channel User-configurable 1300 Ch/s net, 65 Ch/s at 20-ch Simultaneous 3.27" x 4.51" x 0.60" (83.1mm x 114.6mm x 15.3mm) -40°C to +85°C -40°C to +85°C 0 to 95% Noncondensing ISM Group 1 Class A ISM Group 1 Performance A Performance A Performance B Certifications Heavy Industrial CE Compliant UL/cUL (Class I, Division 2, Groups A, B, C, D) File E232858 | Continuous Transient CMV Channel-to-Bus Channel-to-channel | ANSI/IEEE C37.90.1 1500Vrms, 1 Minute 150Vrms, 212 V _{PEAK} | | |
| Power Supply Current Dimensions (h)x(w)x(d) Environmental Operating Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT Certifications Page 13.27" x 4.51" x 0.60" (83.1mm x 114.6mm x 15.3mm) -40°C to +85°C -40°C to +85°C 0 to 95% Noncondensing ISM Group 1 Class A ISM Group 1 Performance A Performance B Certifications Heavy Industrial CE Compliant UL/cUL (Class I, Division 2, Groups A, B, C, D) File E232858 | Logic Selection Block Write Default Relay State | 20 Channel | | |
| (h)x(w)x(d) Environmental Operating Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT Certifications (83.1mm x 114.6mm x 15.3mm) | Update Rate Power Supply Current | | | |
| Operating Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT Certifications Oto 95% Noncondensing ISM Group 1 Class A ISM Group 1 Performance A Performance B Heavy Industrial CE Compliant UL/cUL (Class I, Division 2, Groups A, B, C, D) File E232858 | | | | |
| UL/cUL (Class I, Division 2, Groups A, B, C, D) File E232858 | Operating Temperature Storage Temperature Relative Humidity Emissions, EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF | -40°C to +85°C 0 to 95% Noncondensing ISM Group 1 Class A ISM Group 1 Performance A | | |
| | Certifications | UL/cUL (Class I, Division 2, Groups A, B, C, D) File E232858 | | |

NOTES:

Ordering Information

| Model | Description | |
|----------------|--|--|
| MAQ20-DODC20SK | Discrete Output Module; Up to 60VDC Signals, 3A Current, 20-ch | |

| Field Connection (MAQ20-DODC20SK) Terminal Field Connection (MAQ20-DODC20SK) CH0 +OUT 1 2 CH0 -OUT (MAQ20-DODC20SK) CH1 +OUT 3 4 CH1 -OUT (CH1 -OUT (CH2 +OUT (CH2 +OUT (CH3 +OUT (CH3 +OUT (CH3 +OUT (CH4 +O | | | | |
|--|------------|----------|----------|------------|
| CH1 +OUT 3 4 CH1 -OUT CH2 +OUT 5 6 CH2 -OUT CH3 +OUT 7 8 CH3 -OUT CH4 +OUT 9 10 CH4 -OUT CH5 +OUT 11 12 CH5 -OUT CH6 +OUT 13 14 CH6 -OUT CH7 +OUT 15 16 CH7 -OUT CH8 +OUT 17 18 CH8 -OUT CH9 +OUT 19 20 CH9 -OUT CH10 +OUT 21 22 CH10 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | Connection | Terminal | Terminal | Connection |
| CH2 +OUT 5 6 CH2 -OUT CH3 +OUT 7 8 CH3 -OUT CH4 +OUT 9 10 CH4 -OUT CH5 +OUT 11 12 CH5 -OUT CH6 +OUT 13 14 CH6 -OUT CH7 +OUT 15 16 CH7 -OUT CH8 +OUT 17 18 CH8 -OUT CH9 +OUT 19 20 CH9 -OUT CH10 +OUT 21 22 CH10 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH0 +OUT | 1 | 2 | CH0 –OUT |
| CH3 +OUT 7 8 CH3 -OUT CH4 +OUT 9 10 CH4 -OUT CH5 +OUT 11 12 CH5 -OUT CH6 -OUT CH6 +OUT 13 14 CH6 -OUT CH7 +OUT 15 16 CH7 -OUT CH8 +OUT 19 20 CH9 -OUT CH9 +OUT 19 20 CH9 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH16 +OUT 35 36 CH17 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH1 +OUT | 3 | 4 | CH1 –OUT |
| CH4 +OUT 9 10 CH4 -OUT CH5 +OUT 11 12 CH5 -OUT CH6 +OUT 13 14 CH6 -OUT CH7 +OUT 15 16 CH7 -OUT CH8 +OUT 17 18 CH8 -OUT CH9 +OUT 19 20 CH9 -OUT CH10 +OUT 21 22 CH10 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH2 +OUT | 5 | 6 | CH2 –OUT |
| CH5 +OUT 11 12 CH5 -OUT CH6 +OUT 13 14 CH6 -OUT CH7 +OUT 15 16 CH7 -OUT CH8 +OUT 17 18 CH8 -OUT CH9 +OUT 19 20 CH9 -OUT CH10 +OUT 21 22 CH10 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH17 +OUT 37 38 CH18 -OUT CH18 +OUT 37 38 CH18 -OUT | CH3 +OUT | 7 | 8 | CH3 –OUT |
| CH6 +OUT CH7 +OUT CH7 +OUT CH8 +OUT CH8 +OUT CH9 +OUT CH9 +OUT CH10 +OUT CH11 +OUT CH12 +OUT CH13 +OUT CH15 +OUT CH15 +OUT CH15 +OUT CH16 +OUT CH16 +OUT CH17 +OUT CH17 +OUT CH18 +OUT CH17 +OUT CH18 +OUT CH18 +OUT CH17 +OUT CH18 +OUT CH18 +OUT CH18 +OUT CH18 +OUT CH17 +OUT CH18 +OUT CH18 +OUT CH17 +OUT CH18 +OUT CH18 +OUT CH18 +OUT CH17 +OUT CH18 +OUT CH1 | CH4 +OUT | 9 | 10 | CH4 –OUT |
| CH7 +OUT CH8 +OUT CH8 +OUT CH9 +OUT CH9 +OUT CH10 +OUT CH11 +OUT CH11 +OUT CH12 +OUT CH13 +OUT CH15 +OUT CH15 +OUT CH16 +OUT CH16 +OUT CH17 +OUT CH18 +OUT C | CH5 +OUT | 11 | 12 | CH5 –OUT |
| CH8 +OUT 17 18 CH8 –OUT CH9 +OUT 19 20 CH9 –OUT CH10 +OUT 21 22 CH10 –OUT CH11 +OUT 23 24 CH11 –OUT CH12 +OUT 25 26 CH12 –OUT CH13 +OUT 27 28 CH13 –OUT CH14 +OUT 29 30 CH14 –OUT CH15 +OUT 31 32 CH15 –OUT CH16 +OUT 33 34 CH16 –OUT CH17 +OUT 35 36 CH17 –OUT CH18 +OUT 37 38 CH18 –OUT | CH6 +OUT | 13 | 14 | CH6 -OUT |
| CH9 +OUT 19 20 CH9 -OUT CH10 +OUT 21 22 CH10 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH7 +OUT | 15 | 16 | CH7 -OUT |
| CH10 +OUT 21 22 CH10 -OUT CH11 +OUT 23 24 CH11 -OUT CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH8 +OUT | 17 | 18 | CH8 –OUT |
| CH11 +OUT CH12 +OUT CH12 +OUT CH13 +OUT CH13 +OUT CH13 +OUT CH14 +OUT CH15 +OUT CH16 +OUT CH17 +OUT CH18 +OUT | CH9 +OUT | 19 | 20 | CH9 –OUT |
| CH12 +OUT 25 26 CH12 -OUT CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH10 +OUT | 21 | 22 | CH10 –OUT |
| CH13 +OUT 27 28 CH13 -OUT CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH11 +OUT | 23 | 24 | CH11 -OUT |
| CH14 +OUT 29 30 CH14 -OUT CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH12 +OUT | 25 | 26 | CH12 –OUT |
| CH15 +OUT 31 32 CH15 -OUT CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH13 +OUT | 27 | 28 | CH13 –OUT |
| CH16 +OUT 33 34 CH16 -OUT CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH14 +OUT | 29 | 30 | CH14 –OUT |
| CH17 +OUT 35 36 CH17 -OUT CH18 +OUT 37 38 CH18 -OUT | CH15 +OUT | 31 | 32 | CH15 –OUT |
| CH18 +OUT 37 38 CH18 –OUT | CH16 +OUT | 33 | 34 | CH16 -OUT |
| | CH17 +OUT | 35 | 36 | CH17 -OUT |
| CH19 +OUT 39 40 CH19 –OUT | CH18 +OUT | 37 | 38 | CH18 –OUT |
| | CH19 +OUT | 39 | 40 | CH19 –OUT |

For input connections and full details on module operation, refer to:

MAQ20-DODC20SK Discrete Output Module Hardware User Manual

^{*}Contact factory or your local Dataforth sales office for maximum values.