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*Supplement for*
*SmartStack™ Modules*

# SmartStack™ Modules

**November 10, 1999** **GFK-1601A**

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## Caution

**Caution notices are used where equipment might be damaged if care is not taken.**

## Note

Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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## Revisions to This Manual

This version (GFK-1601A) of the **SmartStack™ Modules Supplement** contains the following revisions and additions:

1. Added three SmartStack Module Data Modules: IC300DIQ712; IC300DIQ722;and IC300ADC920.

2. Revised the Configuration section in the following SmartStack Data Sheets by adding a **Module Setup** tab. The Module Setup tab is used in applications where it is necessary to change the default output states (for digital modules) or default output values (for analog modules.) when the controller enters the idle/stop mode.

   Also added a **Warning Statement** in the Configuration section indicating that extreme caution must be exercised when changing the default settings using the Module Setup tab.

| | |
|---|---|
| IC300DQM202 | IC300ADC920 |
| IC300DIQ511/611 | IC300DAC001/101 |
| IC300DIQ711 | IC300DAC002/102 |
| IC300DIQ512/612 | IC300MIX011/111 |
| IC300DIQ712 | IC300MIX022/122 |
| IC300DIQ522/622 | IC300MIX901 |
| IC300DIQ524/624 | IC300MIX902 |
| IC300DIQ935 | |

3. Made changes to the following SmartStack Modules as indicated:

| | |
|---|---|
| IC300DIQ511<br>IC300DIQ611 | **Specification Table:**<br>Revised Output Protection. |
| IC300DIQ711 | **Section 2.2, Output Wiring:**<br>Revised OCS graphic to depict the bottom view instead of the top view.<br>Revised Output pin-out table to match the pins with the corresponding outputs. |
| IC300DIQ512<br>IC300DIQ612 | **Specification Table:**<br>Revised Input and Output Commons per Module.<br>Renamed Output Operating Voltage to Coil Voltage and changed parameter value.<br>Renamed Peak Voltage to Contact Voltage and changed parameter value.<br>Revised ON Voltage drop parameter. |
| IC300DIQ712 | New |
| IC300DIQ522<br>IC300DIQ622 | **Specification Table:**<br>Renamed Operating Voltage to Coil Voltage and changed parameter value.<br>Revised Wiring drawing by removing + and – signs on outputs.<br>Renamed Peak Voltage to Contact Voltage. No change in parameter. |
| IC300DIQ722 | New |
| IC300DIQ524<br>IC300DIQ624 | **Specification Table:**<br>Revised Input and Output Commons per Module.<br>Revised Input Impedance (Revised parameter from “=10K” to “+10K.”)<br>Relabeled Output parameter “Peak Voltage” as “Contact Voltage.” |
| IC300ADC020<br>IC300ADC120 | **Section 2, Wiring Drawing**<br>Revised label on third set of inputs from “T4-20mA” to “4-20mA.” |

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| | |
|---|---|
| IC300ADC920 | New |
| IC300THM000<br>IC300THM100 | **Specification Table:**<br>Added note regarding accuracy specifications. |
| IC300MIX022<br>IC300MIX122 | **Revised Section 5.1, Example, Item 2:**<br>Changed "+20VDC" to "+20mA." |
| IC300MIX901 | **Specification Table:**<br>Deleted Analog Input Usable Resolution.<br>Deleted Analog Output Voltage Output Resolution.<br>**Section 2.1, Digital Input/Output (P1) Wiring Drawing**<br>Revised labeling in terminal block –renamed "C" to "C1."<br>Revised Digital Input/Output table (P1) – renamed "C" to "C1."<br>**Section 2.2, Analog Input/Output (P2) Wiring Drawing**<br>Revised labeling in terminal block – renamed "C" to "C2" and "C3."<br>Revised Analog In and Out Pin-out table (P2) – renamed "C" to "C2" and "C3." |
| IC300MIX902 | **Specification Table:**<br>Revised Analog Input Input Impedance (Revised "200 Ohm **>**" to "200 Ohms **<**.")<br>Added note to Analog Output Maximum Inaccuracy.<br>**Section 2.1, Digital Input/Output (P1) Wiring Drawing**<br>Revised labeling in terminal block –renamed "C" to "C1."<br>Revised Digital Input/Output table (P1) – renamed "C" to "C1."<br>**Section 2.2, Analog Input/Output (P2) Wiring Drawing**<br>Revised labeling in terminal block – renamed "C" to "C2" and "C3."<br>Revised Analog In and Out Pin-out table (P2) – renamed "C" to "C2" and "C3."<br>**Section 2.2, Revised drawing.**<br>Revised OCS Top View Drawing by moving location of connector.<br>**Section 4**<br><br>**Section 5.1, Conversion of Real-World Inputs into Controller Table**<br>Revised input conversion table by removing –20 to +20mA range. |
| IC300DQM201 | Module is discontinued. |
| IC300DQM202 | **Section 6, Revised Derating Chart.** |
| IC300HSC600<br>IC300HSC601 | Revised Output Protection. |

4. Added footer note in all SmartStack Module data sheets to indicate that the data sheets are published individually and also as a part of the SmartStack Supplement.

5. Revised specification blocks for UL and CE approvals by indicating the appropriate reference documents that users need to refer to.

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# CHAPTER 1: INTRODUCTION

## 1.1 Scope

This supplement contains data sheets for the SmartStack I/O Option Modules. Wiring diagrams, specifications, and other pertinent information are provided. Installation and configuration procedures that are common to all SmartStack Modules are covered in the Control Station Hardware Manual (GFK-1631). Table 1.1 contains a list of SmartStack Modules that are currently available.

**Table 1.1 - SMARTSTACK™ MODULES**

| | | |
|---|---|---|
| **DIGITAL INPUT MODULES** | | |
| 12/24VDC Input | Positive/Negative Logic | IC300DIM210 |
| **DIGITAL OUTPUT MODULES** | | |
| Relay Output | 4A Maximum | IC300DQM202 |
| **DIGITAL INPUT AND OUTPUT COMBINATION MODULES** | | |
| Mixed DC I/O | 4 Channel, 12/24VDC (Isolated) Digital In, Positive/Negative Logic, 4 Channel, 24VDC Out, Negative Logic | IC300DIQ511 |
| | 8 Channel, 12/24VDC (Isolated) Digital In, Positive/Negative Logic, 8 Channel, 24VDC Out, Negative Logic | IC300DIQ611 |
| Mixed DC I/O | 16 Channel, 12/24 VDC In, Positive/Negative Logic 12 Channel, 24 VDC Out, Negative Logic | IC300DIQ711 |
| Mixed DC I/O | 4 Channel, 12/24VDC, (Isolated) Digital In, Positive/Negative Logic 4 Channel, 10-28VDC (Sourcing) Out, Positive Logic | IC300DIQ516 |
| | 8 Channel, 12/24VDC In, (Isolated) Digital In, Positive/Negative Logic 8 Channel, 10-28VDC (Sourcing) Out, Positive Logic | IC300DIQ616 |
| Mixed DC I/O | 16 Channel, 12/24VDC In (Isolated) Digital In, Positive/Negative Logic 12 Channel, 10-28VDC (Sourcing) Out, Positive Logic | IC300DIQ716 |
| Mixed I/O | 4 Channel, 12/24VDC (Isolated) Digital In, Positive/Negative Logic, 3 Channel, 3A Relay Out | IC300DIQ512 |
| | 8 Channel, 12/24VDC (Isolated) Digital In, Positive/Negative Logic, 6 Channel, 3A Relay Out | IC300DIQ612 |
| Mixed I/O | 14 Channel, 12/24VDC (Isolated) Digital In, Positive/Negative Logic, 10 Channel, 3A Relay Out | IC300DIQ712 |
| Mixed I/O | 4 Channel, 120 VAC In Positive Logic 3 Channel, 3A Relay Out | IC300DIQ522 |
| Mixed I/O | 8 Channel, 120 VAC In Positive Logic 6 Channel, 3A Relay Out | IC300DIQ622 |

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| | | |
|---|---|---|
| Mixed I/O | 14 Channel, 120 VAC In<br>Positive Logic<br>10 Channel, 3A Relay Out | IC300DIQ722 |
| AC Input / AC Output | 4 Channel, 120VAC In, Positive Logic<br>4 Channel, 80-240VAC Out, Positive Logic | IC300DIQ524 |
| | 8 Channel, 120VAC In, Positive Logic<br>8 Channel, 80-240VAC Out, Positive Logic | IC300DIQ624 |
| High Density<br>Mixed DC I/O | 32 Channel, 12/24 VDC, Positive Logic<br>40 Channel, 24Vdc Out, Negative Logic<br>50mA Maximum, Non-Inductive | IC300DIQ935 |
| **ANALOG INPUT MODULES** | | |
| +/-10VDC Analog Input | 2 Channels, 12 Bit Resolution, +/-10VDC | IC300ADC010 |
| | 4 Channels, 12 Bit Resolution, +/-10VDC | IC300ADC110 |
| 4-20mA Analog Input | 2 Channels, 12 Bit Resolution, 4-20mA | IC300ADC020 |
| | 4 Channels, 12 Bit Resolution, 4-20mA | IC300ADC120 |
| Thermistor / Current/<br>Voltage Analog Input | 12 Channels, 12 Bit Resolution,<br>4-20mA / 0-5VDC | IC300ADC920 |
| RTD Input | 2 Channels | IC300RTD000 |
| | 4 Channels | IC300RTD100 |
| Thermocouple Input | 2 Channels | IC300THM000 |
| | 4 Channels | IC300THM100 |
| **ANALOG OUTPUT MODULES** | | |
| +/-10VDC Analog Output | 2 Channels, 14 Bit Resolution, +/-10VDC | IC300DAC001 |
| | 4 Channels, 14 Bit Resolution, +/-10VDC | IC300DAC101 |
| 4-20mA Analog Output | 2 Channels, 14 Bit Resolution, 4-20mA | IC300DAC002 |
| | 4 Channels, 14 Bit Resolution, 4-20mA | IC300DAC102 |
| **ANALOG INPUT AND OUTPUT COMBINATION MODULES** | | |
| +/-10VDC Analog I/O | 1 Channel, 12 Bit Resolution, +/-10VDC In,<br>1 Channel, 12 Bit Resolution, +/-10VDC Out | IC300MIX011 |
| | 2 Channel, 12 Bit Resolution, +/-10VDC In,<br>2 Channel, 12 Bit Resolution, +/-10VDC Out | IC300MIX111 |
| 20mA Analog I/O | 1 Channel, 12 Bit Resolution, 20mA In<br>1 Channel, 12 Bit Resolution, 20mA Out | IC300MIX022 |
| | 2 Channel, 12 Bit Resolution, 20mA In,<br>2 Channel, 12 Bit Resolution, 20mA Out | IC300MIX122 |
| **ANALOG / DIGITAL INPUT AND OUTPUT COMBINATION MODULES** | | |
| +/-10VDC<br>Analog / Digital I/O | 4 Channel, Analog Input, +/-10VDC In<br>2 Channel Analog Output, +/-10VDC Out<br>8 Channel, 12 Bit Resolution,<br>24VDC Bipolar Digital Input<br>8 Channel, 12 Bit Resolution,<br>10-28VDC, 0.5 Amp Sourcing Digital Output | IC300MIX901 |
| 4-20mA<br>Analog / Digital I/O | 4 Channel, Analog Input, 20mA In<br>2 Channel Analog Output, 20mA Out<br>8 Channel, 12 Bit Resolution,<br>24VDC Bipolar Digital Input<br>8 Channel, 12 Bit Resolution,<br>10-28VDC, 0.5 Amp Sourcing Digital Output | IC300MIX902 |

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| SPECIALTY MODULES | | |
|---|---|---|
| ASCII BASIC<br><br>Product also has a detailed Supplement (GFK-1666) which is ordered separately. | 3 High Speed Communication Ports | IC300ASC100 |
| High Speed Counter<br><br>Product also has a detailed Supplement (GFK-1643) which is ordered separately. Covers HSC600 and HSC601. | High Speed Counter Inputs,<br>Sinking Pulse Outputs | IC300HSC600 |
| | High Speed Counter Inputs,<br>Sourcing Pulse Outputs | IC300HSC601 |
| Stepper Positioning<br><br>Product also has a detailed Supplement (GFK-1644) which is ordered separately. | Stepper Inputs / Stepper Outputs | IC300STP100 |

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## NOTES

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# 12/24Vdc Input Module

**IC300DIM210**

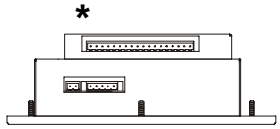
**Positive/Negative Logic**

## 1 SPECIFICATIONS

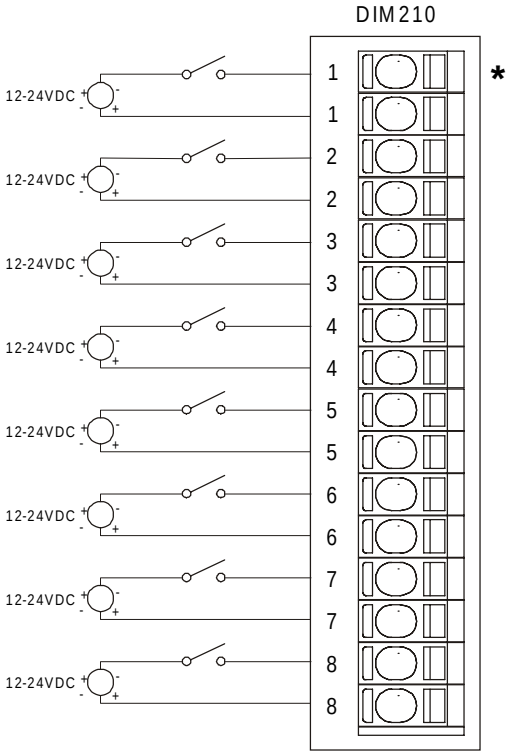
| | | | |
|---|---|---|---|
| Inputs per Module | 8 isolated | Input Characteristics | Differential and BiDirectional |
| Commons per Module | 8 | Maximum OFF Current | 200µA |
| Input Voltage Range | 12-24VDC | Base Power Required | 30mA |
| Peak Voltage | 35VDC Max. | OFF to ON Response | 1ms. |
| Isolation Voltage (Channel to Channel and Channel to Bus) | 500VDC | ON to OFF Response | 1ms. |
| Required Power (Steady State) | 0.92W (38.5mA @ 24VDC) | Terminal Type | Spring Clamp, Removable |
| Required Power (Inrush) | Negligible | Status Indicator | 8 LEDs |
| ON Voltage Level | 9VDC Min. | Relative Humidity | 5 to 95% Non-condensing |
| OFF Voltage Level | 3VDC Max. | Operating Temperature | 0° to 60° Celsius |
| Input Impedance | . 10K Ohms | CE | Pending |
| Minimum ON Current | 1 mA. | UL | Refer to GFK-1754 |
| Weight | 9 oz. (256 g) | | |

## 2 WIRING

| Pin | Signal |
|---|---|
| 1 | Input 1 +/- |
| 1 | Input 1 -/+ |
| 2 | Input 2 +/- |
| 2 | Input 2 -/+ |
| 3 | Input 3 +/- |
| 3 | Input 3 -/+ |
| 4 | Input 4 +/- |
| 4 | Input 4 -/+ |
| 5 | Input 5 +/- |
| 5 | Input 5 -/+ |
| 6 | Input 6 +/- |
| 6 | Input 6 -/+ |
| 7 | Input 7 +/- |
| 7 | Input 7 -/+ |
| 8 | Input 8 +/- |
| 8 | Input 8 -/+ |




**OCS Bottom View – Shows corresponding I/O pin**



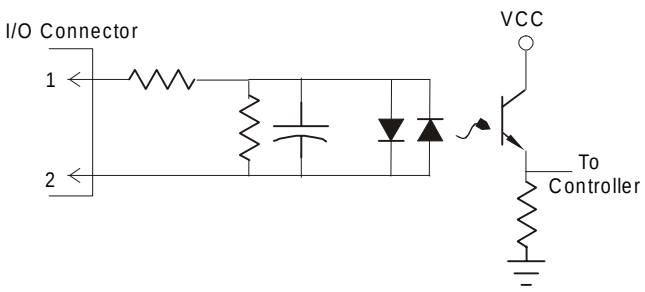

**GFK-1603A**

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## 3 INTERNAL CIRCUIT SCHEMATIC




## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631). Although the module has no user defined parameters, the I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 TECHNICAL ASSISTANCE

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# Relay Output Module

**IC300DQM202**

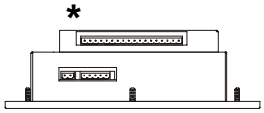
**4 Amp Maximum**

## 1 SPECIFICATIONS

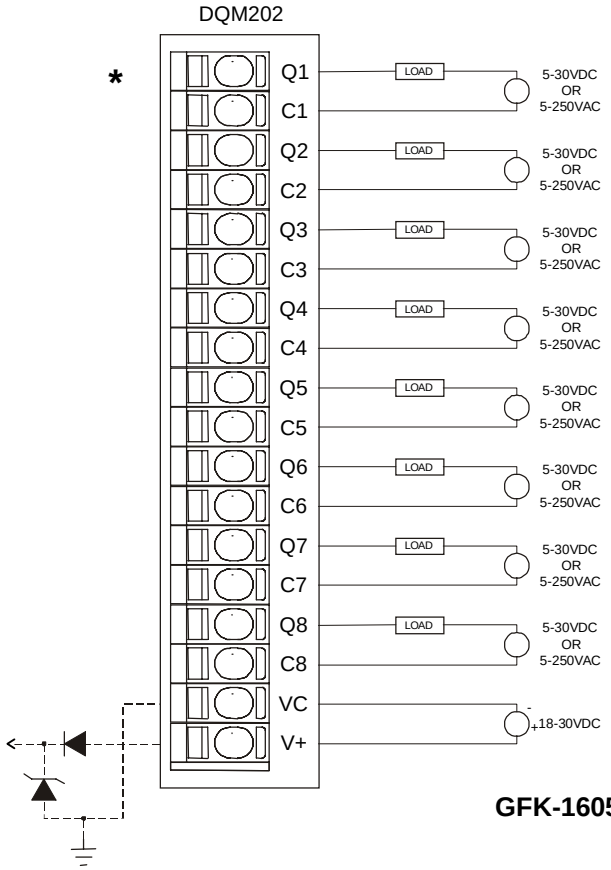
| | | | |
|---|---|---|---|
| Outputs per Module | 8 N.O. Relay | Maximum Inrush Current | 10A |
| Commons per Module | 1 | OFF to ON Response | 10ms Max. |
| Output Points Consumed | 8 | ON to OFF Response | 5ms. Max. |
| Isolation (Channel to Channel) (Channel to Bus) | 500VDC | Terminal Type | Spring Clamp, Removable |
| Operating Voltage | 18-32VDC | Relative Humidity | 5 to 95% Non-condensing |
| Output Type | NO | Operating Temperature | 0° to 60° Celsius |
| Required Power (Steady State) | 0.13W ( 5.5mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Operating Temperature Code T4A; Also refer to GFK-1754 |
| ON Voltage Level | 0.15V | Status Indicator | 8 LEDs |
| Maximum Load Voltage | 250 VAC, 30VDC Max. | Weight | 10.5 oz. (298 g) |
| Maximum Load Current (resistive) | 4A Max. (Subject to Derating) | Protection | Internal 10A non-replaceable fuse and reverse polarity protection |
| Maximum Leakage Current | 5µA | | |

## 2 WIRING

| Pin | Signal | |
|---|---|---|
| Q1 | Output 1 | N.O. Contact |
| C1 | Output 1 | Common |
| Q2 | Output 2 | N.O. Contact |
| C2 | Output 2 | Common |
| Q3 | Output 3 | N.O. Contact |
| C3 | Output 3 | Common |
| Q4 | Output 4 | N.O. Contact |
| C4 | Output 4 | Common |
| Q5 | Output 5 | N.O. Contact |
| C5 | Output 5 | Common |
| Q6 | Output 6 | N.O. Contact |
| C6 | Output 6 | Common |
| Q7 | Output 7 | N.O. Contact |
| C7 | Output 7 | Common |
| Q8 | Output 8 | N.O. Contact |
| C8 | Output 8 | Common |
| VC | Relay Coil Voltage Common | |
| V+ | Relay Coil Voltage + | |



**OCS Bottom View – Shows corresponding I/O pin**



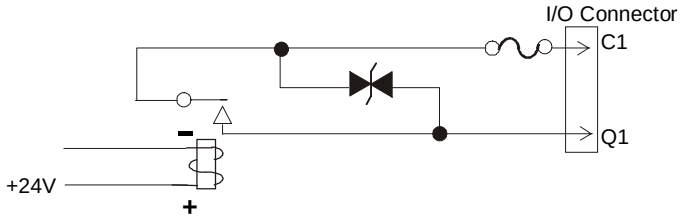

**GFK-1605A**

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## 3 INTERNAL CIRCUIT SCHEMATIC




## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

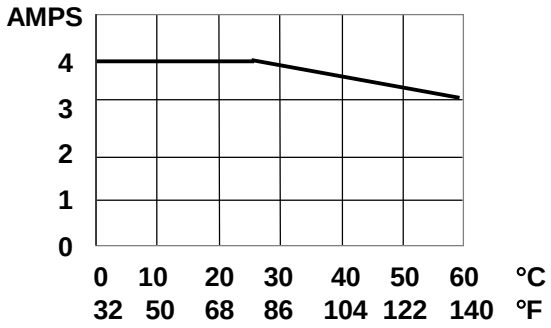
For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.



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# 6 OUTPUT CHARACTERISTICS

## Derating Chart for DQM202




| Typical Relay Life | | | |
|---|---|---|---|
| Voltage and Load Type | Load Current 1 Amp | 2 Amp | 4 Amp |
| 30VDC Resistive | 800K | 500K | 200K |
| 30VDC Inductive | 500K | 250K | 100K |
| 250VAC Resistive | 800K | 500K | 200K |
| 250VAC Inductive | 500K | 250K | 100K |

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# Mixed DC I/O Module

**IC300DIQ511 / IC300DIQ611**
**12/24 Vdc In, Positive/Negative Logic**
**24Vdc Out, Negative Logic**

## 1 SPECIFICATIONS

| INPUT | DIQ511 | DIQ611 |
|---|---|---|
| Inputs per Module | 4 | 8 |
| Commons per Module | 1 | 1 |
| Input Voltage Range | 12-24VDC | |
| Peak Voltage | 35VDC Max. | |
| Isolation (Channel to Bus) | 500VDC | |
| ON Voltage Level | 9VDC | |
| OFF Voltage Level | 3VDC | |

| | DIQ511 | DIQ611 |
|---|---|---|
| Input Characteristics | Bidirectional | |
| Input Impedance | 10K Ohms | |
| Minimum ON Current | 1mA | |
| Maximum OFF Current | 200µA | |
| OFF to ON Response | 1ms. | |
| ON to OFF Response | 1ms. | |
| Status Indicator | 4 | 8 |

| OUTPUT | DIQ511 | DIQ611 |
|---|---|---|
| Outputs per Module | 4 | 8 |
| Commons per Module | 1 | 1 |
| Operating Voltage | 5 - 35VDC | |
| Output Type | Sinking / 10K Pull-Up | |
| Peak Voltage | 35VDC Max. | |
| Output Characteristics | Current Sinking | |
| ON Voltage Level | 1.5VDC Max. | |
| Maximum Load Current | 0.5A Max. | |

| | DIQ511 | DIQ611 |
|---|---|---|
| Output Protection | Short Circuit | |
| Maximum Leakage Current | 100µA | |
| Maximum Inrush Current | 600mA. | |
| Minimum Load | None | |
| OFF to ON Response | 1ms. | |
| ON to OFF Response | 1ms. | |
| Status Indicator | 8 LEDs | |

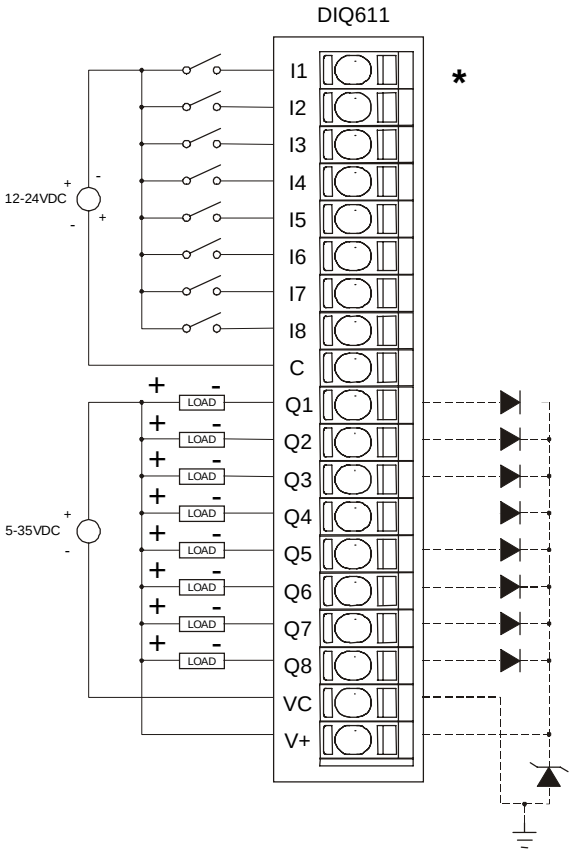
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.18W (7.7mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9 oz. (256 g) |

**GFK-1606A**

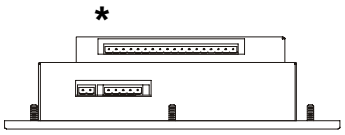

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## 2 WIRING

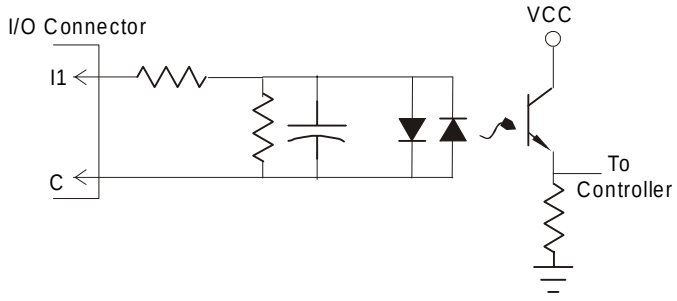


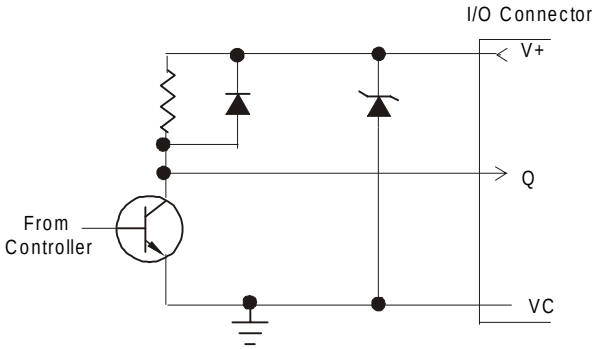

| Pin | Signal | |
|---|---|---|
| | DIQ611 | DIQ511 |
| I1 | Input 1 | Input 1 |
| I2 | Input 2 | Input 2 |
| I3 | Input 3 | Input 3 |
| I4 | Input 4 | Input 4 |
| I5 | Input 5 | No Connection |
| I6 | Input 6 | No Connection |
| I7 | Input 7 | No Connection |
| I8 | Input 8 | No Connection |
| C | Common | |
| Q1 | Output 1 | Output 1 |
| Q2 | Output 2 | Output 2 |
| Q3 | Output 3 | Output 3 |
| Q4 | Output 4 | Output 4 |
| Q5 | Output 5 | No Connection |
| Q6 | Output 6 | No Connection |
| Q7 | Output 7 | No Connection |
| Q8 | Output 8 | No Connection |
| VC | Common | |
| V+ | Load Voltage + | |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATIC




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## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

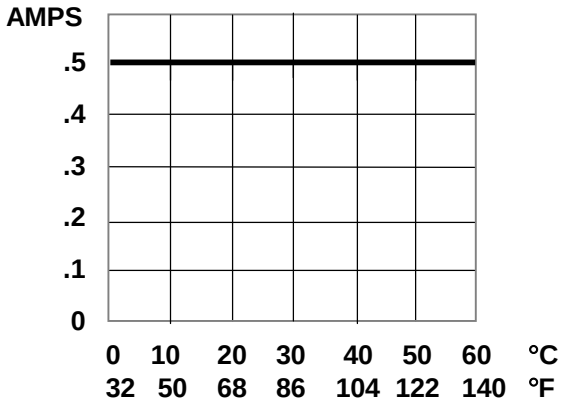
## 5 INSTALLATION / SAFETY

All applicable codes and standards should be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ511 /611**




## 7 TECHNICAL ASSISTANCE

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# Mixed DC I/O Module

**IC300DIQ711**
**(16 Input Channels)**
**12/24 Vdc In, Positive/Negative Logic**
**24Vdc Out, Negative Logic**
**(12 Output Channels)**

## 1 SPECIFICATIONS

| INPUT | DIQ711 | | DIQ711 |
|---|---|---|---|
| Inputs per Module | 16 | Input Characteristics | Bidirectional |
| Commons per Module | 3 | Input Impedance | 10K Ohms |
| Input Voltage Range | 12-24VDC | Minimum ON Current | 1mA |
| Peak Voltage | 35VDC Max. | Maximum OFF Current | 200µA |
| Isolation (Channel to Bus) | 500VDC | OFF to ON Response | 1ms. |
| ON Voltage Level | 9VDC | ON to OFF Response | 1ms. |
| OFF Voltage Level | 3VDC | | |

| OUTPUT | DIQ711 | | DIQ711 |
|---|---|---|---|
| Outputs per Module | 12 | Output Protection | Short Circuit, Reverse Polarity |
| Commons per Module | 1 | Maximum Leakage Current | 100µA |
| Operating Voltage | 5 - 35VDC | Maximum Inrush Current | 600mA. |
| Output Type | Sinking / 10K Pull-Up | Minimum Load | None |
| Peak Voltage | 35VDC Max. | OFF to ON Response | 1ms. |
| Output Characteristics | Current Sinking | ON to OFF Response | 1ms. |
| ON Voltage Level | 1.5VDC Max. | | |
| Maximum Load Current | 0.5A Max. | | |

| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 1.18W (49.5mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Operating Temperature Code T4A; Also refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9 oz. (256 g) |

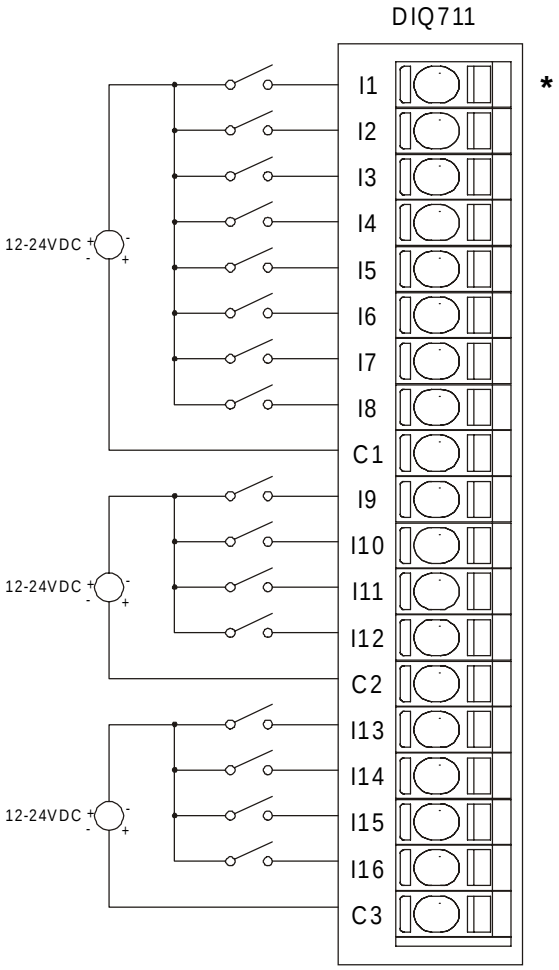
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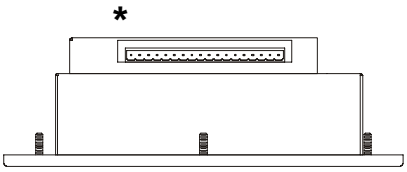
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# 2 WIRING

## *2.1 Input Wiring*




| Pin | Signal DIQ711 Input |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C1 | Common 1 |
| I9 | Input 9 |
| I10 | Input 10 |
| I11 | Input 11 |
| I12 | Input 12 |
| C2 | Common 1 |
| I13 | Input 13 |
| I14 | Input 14 |
| I15 | Input 15 |
| I16 | Input 16 |
| C3 | Common 3 |

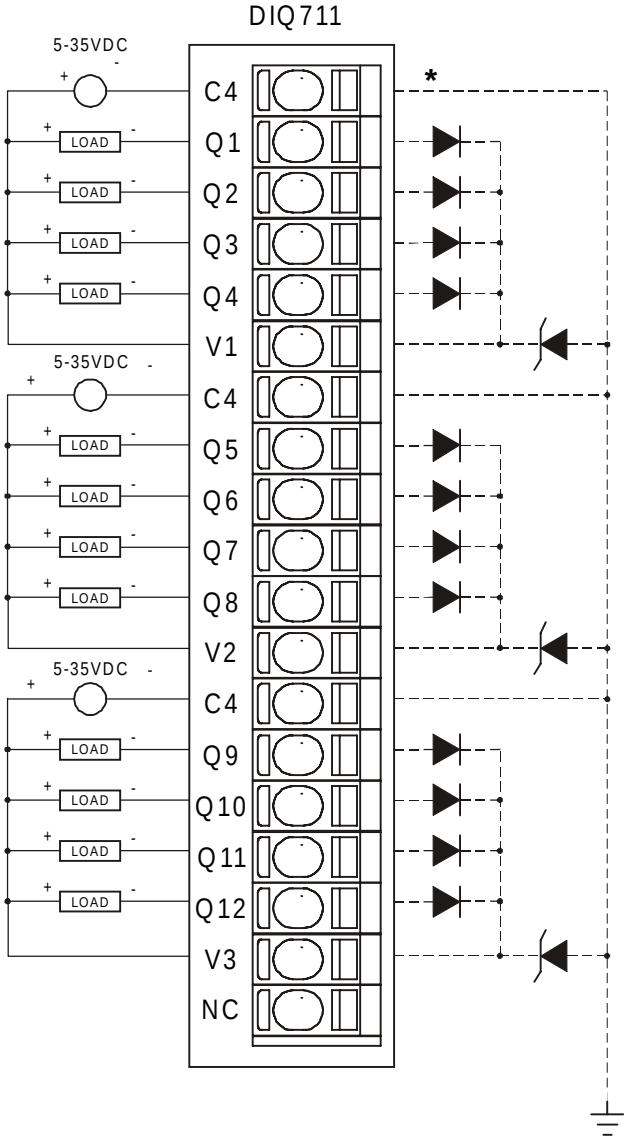



**OCS Top View – Shows Corresponding I/O pin location**

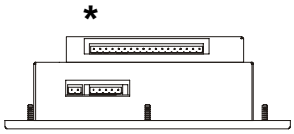


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*2.2 Output Wiring*




| Pin | Signal DIQ711 Output |
|---|---|
| C4 | Common 4 |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| V1 | Load Power 1 |
| C4 | Common 4 |
| Q5 | Output 5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| V2 | Load Power 2 |
| C4 | Common 4 |
| Q9 | Output 9 |
| Q10 | Output 10 |
| Q11 | Output 11 |
| Q12 | Output 12 |
| V3 | Load Power 3 |
| NC | No Connection |

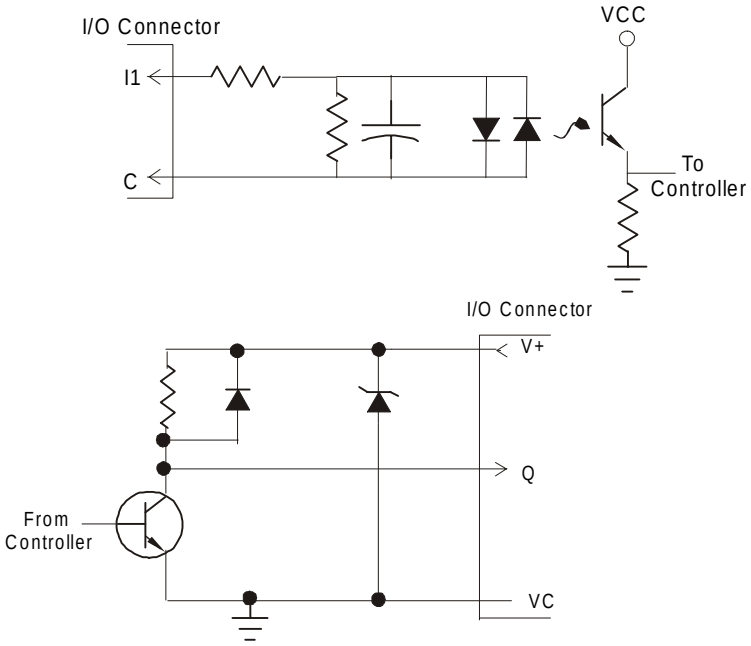



**OCS Bottom View – Shows corresponding I/O pin location**



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## 3 INTERNAL CIRCUIT SCHEMATIC




## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.


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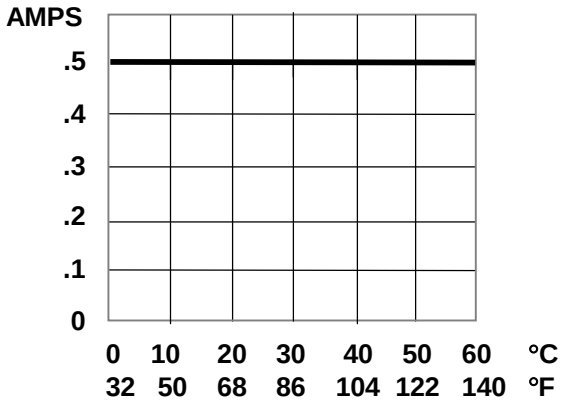
## 5 INSTALLATION / SAFETY

All applicable codes and standards should be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ711**




## 7 TECHNICAL ASSISTANCE

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# Mixed I/O Module

## IC300DIQ512 / IC300DIQ612
## 12/24 Vdc In, Positive/Negative Logic
## 3A Relay Out

## 1 SPECIFICATIONS

| INPUT | DIQ512 | DIQ612 |
|---|---|---|
| Inputs per Module | 4 isolated | 8 isolated |
| Commons per Module | 1 | 1 |
| Input Voltage Range | 12/24VDC | |
| Peak Voltage | 35VDC Max. | |
| ON Voltage level | Min. 9VDC | |
| OFF Voltage level | Max. 3VDC | |
| Isolation (Channel to bus) | 500VDC | |

| | DIQ512 | DIQ612 |
|---|---|---|
| Input Impedance | > 10K Ohms | |
| Minimum ON Current | 1mA | |
| Maximum OFF Current | 200µA | |
| OFF to ON Response | 1ms. | |
| ON to OFF Response | 1ms. | |
| Status Indicator | 4 | 8 |

| OUTPUT | DIQ512 | DIQ612 |
|---|---|---|
| Outputs per Module | 3 relay | 6 relay |
| Commons per Module | 1 | 2 |
| Output Type | Relay | |
| Coil Voltage | 18-30VDC | |
| Contact Voltage | 250VAC / 30VDC Max. | |
| ON Voltage drop | 0.2V Max. | |
| Fuses | 10A common | |
| Maximum Load current (resistive) | 3A | |

| | DIQ512 | DIQ612 |
|---|---|---|
| Maximum Leakage Current | 5µA | |
| Maximum Inrush Current | 3A | |
| Minimum Load | None | |
| OFF to ON Response | 6ms. Typical | |
| ON to OFF Response | .3ms. Typical | |
| Status Indicator | 3 | 6 |
| Isolation (Channel to bus) | 500VDC | |

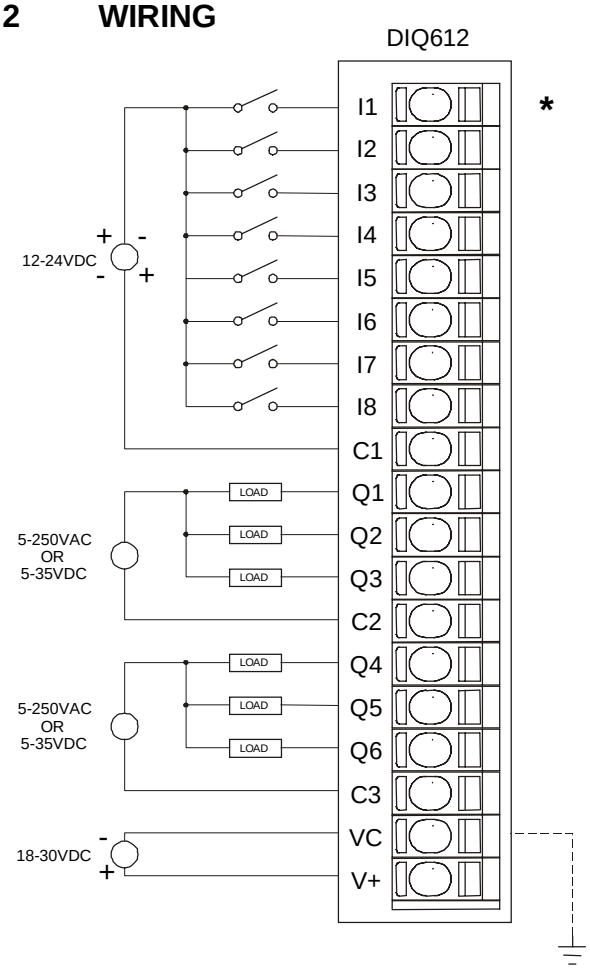
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.23W (9.6mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9 oz. (256 g) |



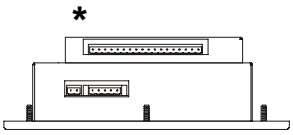
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## 2 WIRING

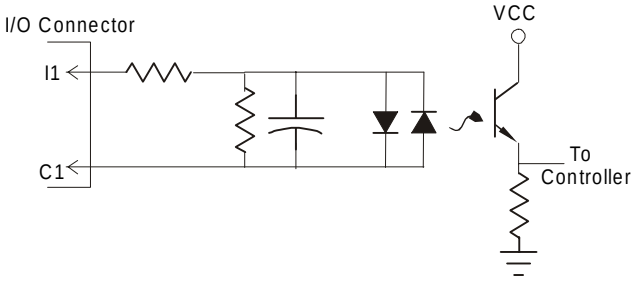


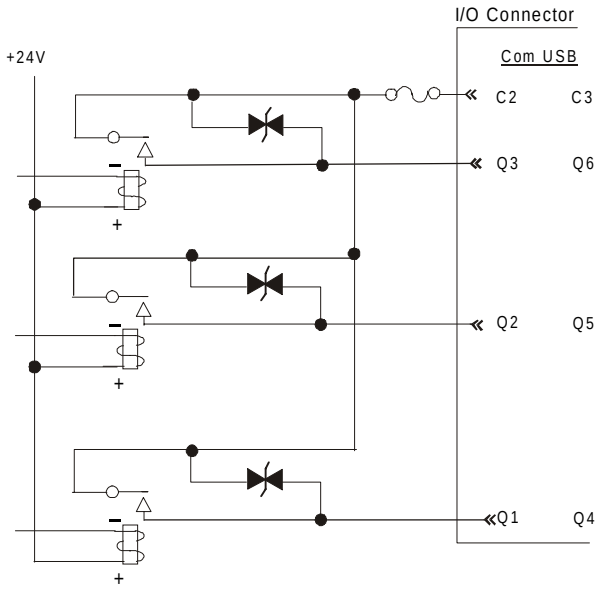

| Pin | Signal | |
|---|---|---|
| | DIQ612 | DIQ512 |
| I1 | Input 1 | Input 1 |
| I2 | Input 2 | Input 2 |
| I3 | Input 3 | Input 3 |
| I4 | Input 4 | Input 4 |
| I5 | Input 5 | No Connection |
| I6 | Input 6 | No Connection |
| I7 | Input 7 | No Connection |
| I8 | Input 8 | No Connection |
| C1 | Common 1 | |
| Q1 | Output 1 | Output 1 |
| Q2 | Output 2 | Output 2 |
| Q3 | Output 3 | Output 3 |
| C2 | Common 2 | |
| Q4 | Output 4 | No Connection |
| Q5 | Output 5 | No Connection |
| Q6 | Output 6 | No Connection |
| C3 | Common 3 | No Connection |
| VC | Relay Coil Voltage Common | |
| V+ | Relay Coil Voltage + | |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATIC




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# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

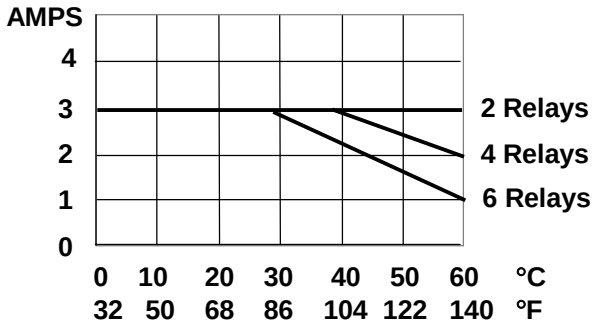
# 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

# 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ512 / 612**




| Typical Relay Life (DIQ512 / 612) | | | |
|---|---|---|---|
| **Voltage (Resistive)** | **Load Current** | | |
| | **1 Amp** | **2 Amp** | **3 Amp** |
| 30VDC | 600K | 250K | 125K |
| 125VAC | 750K | 300K | 150K |
| 250VAC | 500K | 200K | 100K |



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# 7 TECHNICAL SUPPORT

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# Mixed I/O Module

**IC300DIQ712**
**12/24 Vdc In, Positive/Negative Logic**
**3A Relay Out**

## 1 SPECIFICATIONS

| INPUT | DIQ712 | | DIQ712 |
|---|---|---|---|
| Inputs per Module | 14 isolated | Minimum ON Current | 1mA |
| Commons per Module | 3 | Maximum OFF Current | 200µA |
| Input Voltage Range | 12/24VDC | OFF to ON Response | 1ms. |
| Peak Voltage | 35VDC Max. | ON to OFF Response | 1ms. |
| ON Voltage level | Min. 9VDC | Isolation (Channel to bus) | 500VDC |
| OFF Voltage level | Max. 3VDC | | |
| Input Impedance | > 10K Ohms | | |

| OUTPUT | DIQ712 | | DIQ712 |
|---|---|---|---|
| Outputs per Module | 10 relay | Maximum Inrush Current | 3A |
| Commons per Module | 2 | Minimum Load | None |
| Output Type | Relay | OFF to ON Response | 6ms. Typical |
| Coil Voltage | 18-30VDC | ON to OFF Response | .3ms. Typical |
| Contact Voltage | 250VAC / 30VDC Max. | Fuses | 10A common |
| ON Voltage drop | 0.2V Max. | Isolation (Channel to bus) | 500VDC |
| Maximum Load current (resistive) | 3A | Maximum Leakage Current | 5µA |

TBA=To Be Announced

| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | .19W(8mA @ 24VDC) | CE | Pending |
| Required Power (Inrush) | Negligible | UL | Pending |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. |

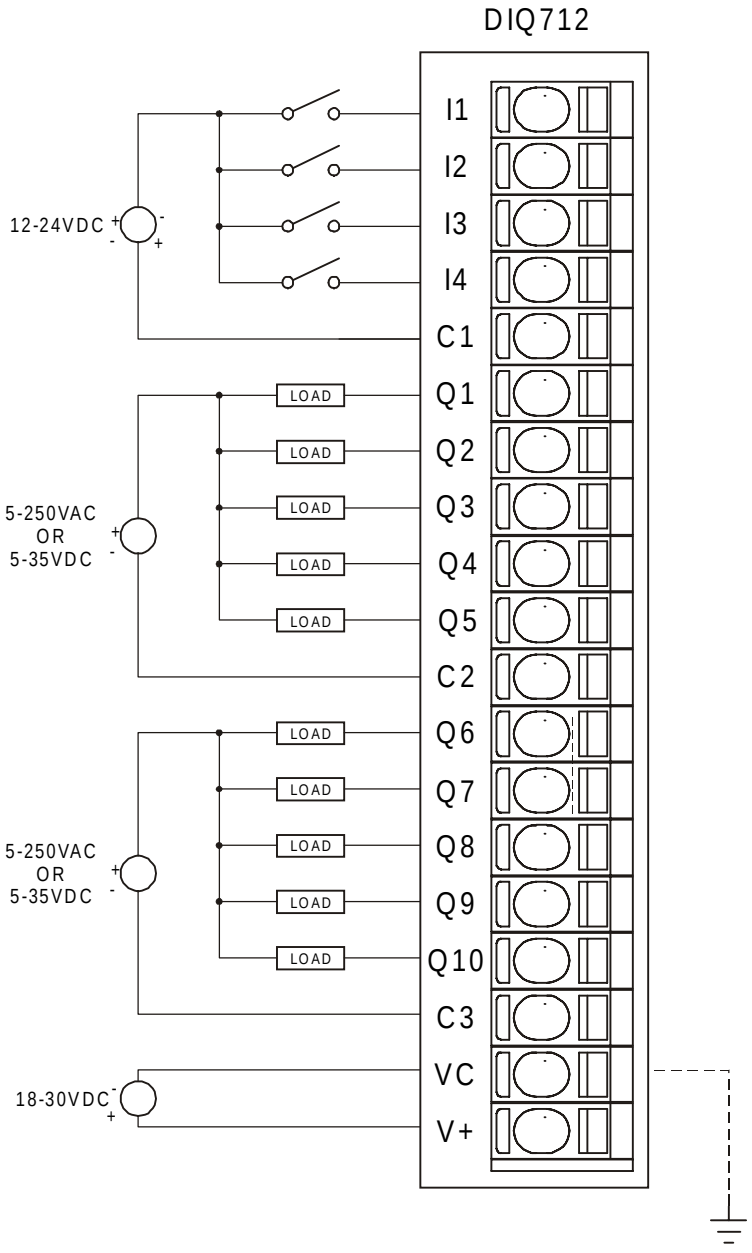
**GFK-1726**


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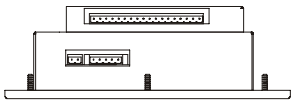
# 2 WIRING *

## 2.1 Input / Output Connector Wiring




| Pin | Signal DIQ712 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| C1 | Common for Inputs1,2,3,4 |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| Q5 | Output 5 |
| C2 | Common for Outputs 1,2,3,4,5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| Q9 | Output 9 |
| Q10 | Output 10 |
| C3 | Common for Outputs 6,7,8,9,10 |
| VC | Relay Coil power common, connected to bus common internally. |
| V+ | Relay Coil Power, +18 to +30VDC, 90mA max. |

*



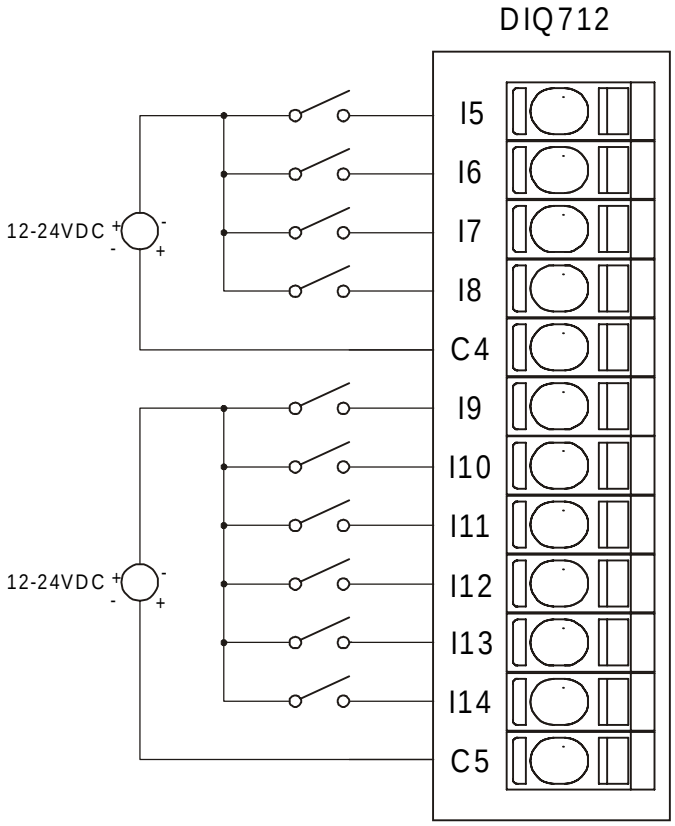
**OCS Bottom View – Shows corresponding I/O pin location**

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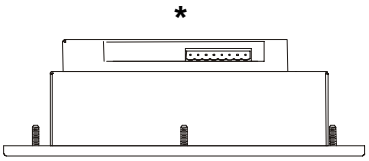
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## 2.2 Input Connector Wiring

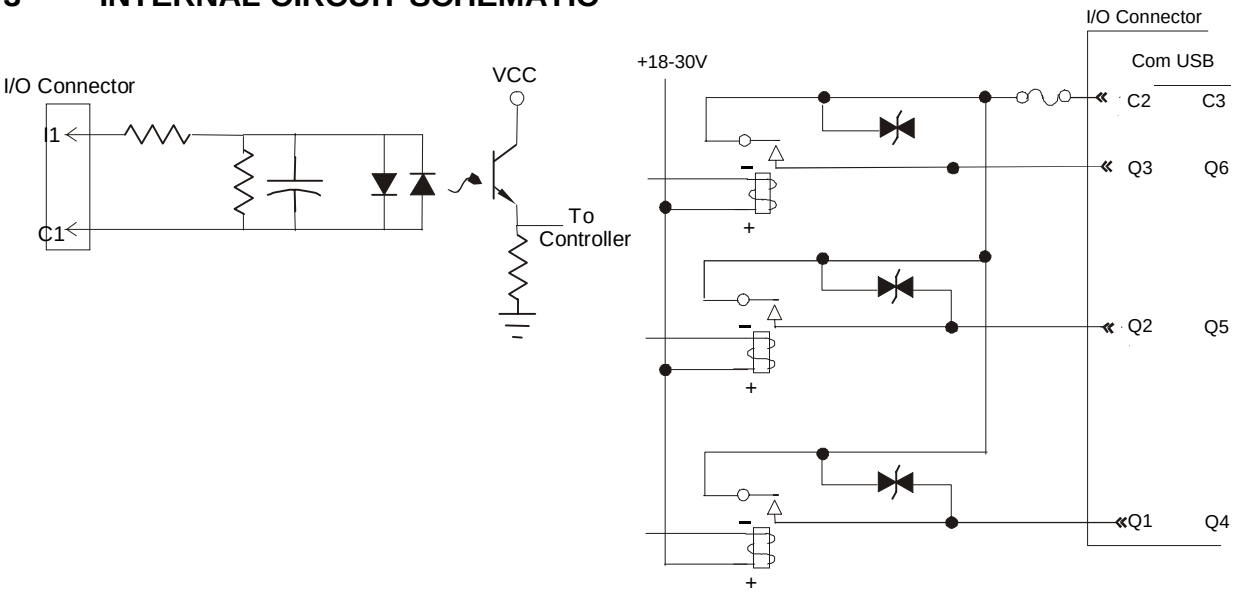



| Pin | Signal DIQ712 |
|---|---|
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C4 | Common for Inputs 5,6,7,8 |
| I9 | Input 9 |
| I10 | Input 10 |
| I11 | Input 11 |
| I12 | Input 12 |
| I13 | Input 13 |
| I14 | Input 14 |
| C5 | Common for Inputs 9,10,11,12,13,14 |




**OCS Top View – Shows corresponding I/O pin location**

# 3 INTERNAL CIRCUIT SCHEMATIC






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# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

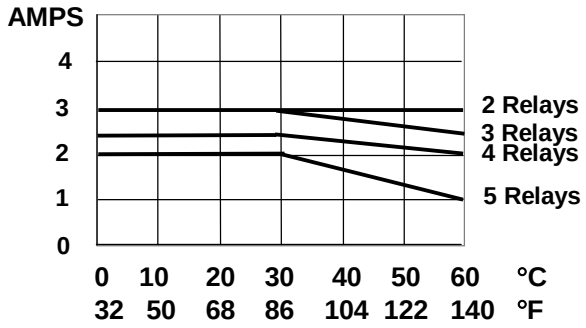
# 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

# 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ712**
**(Each group of 5)**






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| Typical Relay Life (DIQ712) | | | | |
|---|---|---|---|---|
| **Voltage (Resistive)** | **No Load** | **Load Current** | | |
| | | **1 Amp** | **2 Amp** | **3 Amp** |
| 30VDC | 20 Million | 600K | 250K | 125K |
| 125VAC | | 750K | 300K | 150K |
| 250VAC | | 500K | 200K | 100K |

# 7 TECHNICAL SUPPORT

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# Mixed DC I/O Module

## IC300DIQ516 / IC300DIQ616
## 12/24 Vdc In, Positive/Negative Logic
## 24Vdc Out, Positive Logic

## 1 SPECIFICATIONS

| INPUT | DIQ516 | DIQ616 |
|---|---|---|
| Inputs per Module | 4 | 8 |
| Commons per Module | 1 | 1 |
| Input Voltage Range | 12-24VDC | |
| Peak Voltage | 35VDC Max. | |
| Isolation (Channel to Bus) | 500VDC | |
| ON Voltage Level | 9VDC | |
| OFF Voltage Level | 3VDC | |

| | DIQ516 | DIQ616 |
|---|---|---|
| Input Characteristics | Bidirectional | |
| Input Impedance | 10K Ohms | |
| Minimum ON Current | 1mA | |
| Maximum OFF Current | 200µA | |
| OFF to ON Response | 1ms. | |
| ON to OFF Response | 1ms. | |
| Status Indicator | 4 | 8 |

| OUTPUT | DIQ516 | DIQ616 |
|---|---|---|
| Outputs per Module | 4 | 8 |
| Commons per Module | 1 | 1 |
| Operating Voltage | 10 - 28VDC | |
| Output Type | Sourcing / 10K Pull-Down | |
| Peak Voltage | 28VDC Max. | |
| Maximum Load Current | 0.5A Max. | |
| Output Protection | Short Circuit | |

| | DIQ516 | DIQ616 |
|---|---|---|
| Maximum Inrush Current | 650mA | |
| Minimum Load | None | |
| OFF to ON Response | 1ms. | |
| ON to OFF Response | 1ms. | |
| Output Characteristics | Current Sourcing | |
| Status Indicator | 4 | 8 |
| | | |

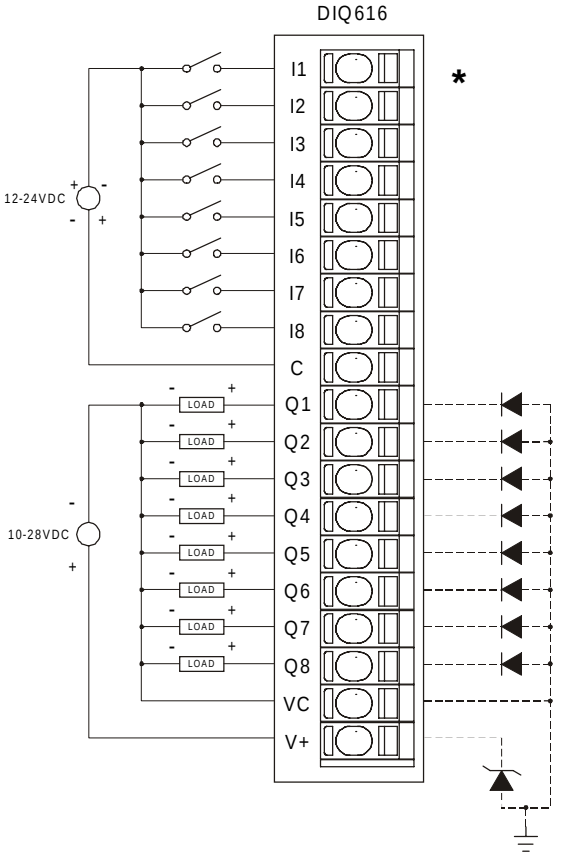
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.14W (6.05mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9 oz. (256 g) |

**GFK-1609A**

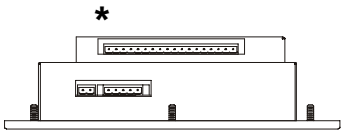


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## 2 WIRING

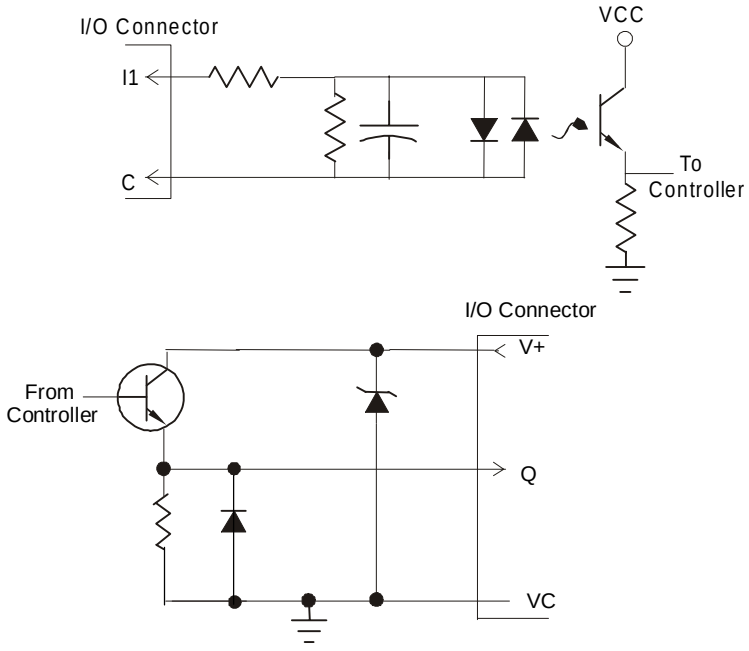



| Pin | Signal | |
|---|---|---|
| | DIQ616 | DIQ516 |
| I1 | Input 1 | Input 1 |
| I2 | Input 2 | Input 2 |
| I3 | Input 3 | Input 3 |
| I4 | Input 4 | Input 4 |
| I5 | Input 5 | No Connection |
| I6 | Input 6 | No Connection |
| I7 | Input 7 | No Connection |
| I8 | Input 8 | No Connection |
| C | Common | |
| Q1 | Output 1 | Output 1 |
| Q2 | Output 2 | Output 2 |
| Q3 | Output 3 | Output 3 |
| Q4 | Output 4 | Output 4 |
| Q5 | Output 5 | No Connection |
| Q6 | Output 6 | No Connection |
| Q7 | Output 7 | No Connection |
| Q8 | Output 8 | No Connection |
| VC | Common | |
| V+ | Load Voltage + | |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATIC




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## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

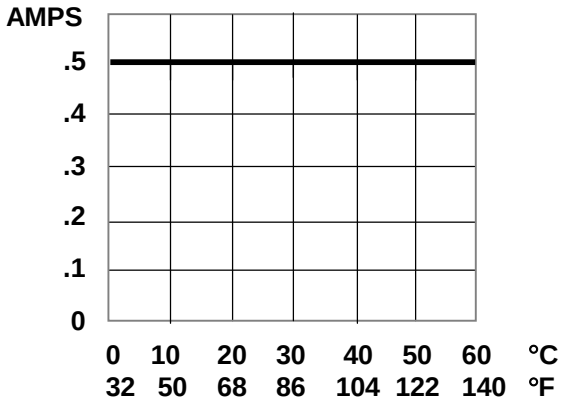
## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ516 /616**




## 7 TECHNICAL ASSISTANCE

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# Mixed DC I/O Module

**IC300DIQ716**
**12/24 Vdc In, Positive/Negative Logic**
**(16 Input Channels)**
**10-28Vdc Out, Positive Logic**
**(12 Output Channels)**

## 1 SPECIFICATIONS

| INPUT | DIQ716 | | DIQ716 |
|---|---|---|---|
| Inputs per Module | 16 | Input Characteristics | Bidirectional |
| Commons per Module | 3 | Input Impedance | 10K Ohms |
| Input Voltage Range | 12-24VDC | Minimum ON Current | 1mA |
| Peak Voltage | 35VDC Max. | Maximum OFF Current | 200µA |
| Isolation (Channel to Bus) | 500VDC | OFF to ON Response | 1ms. |
| ON Voltage Level | 9VDC /1mA minimum | ON to OFF Response | 1ms. |
| OFF Voltage Level | 3VDC | | |

| OUTPUT | DIQ716 | | DIQ716 |
|---|---|---|---|
| Outputs per Module | 12 | Maximum Inrush Current | 650mA |
| Commons per Module | 1 | Minimum Load | None |
| Operating Voltage | 10 - 28VDC | OFF to ON Response | 1ms. |
| Output Type | Sourcing / 10K Pull-Down | ON to OFF Response | 1ms. |
| Peak Voltage | 28VDC Max. | Output Characteristics | Current Sourcing |
| Maximum Load Current | 0.5A Max. | Output Protection | Short Circuit |

| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.13W (5.5mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Operating Temperature Code T4; Also refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9 oz. (256 g) |

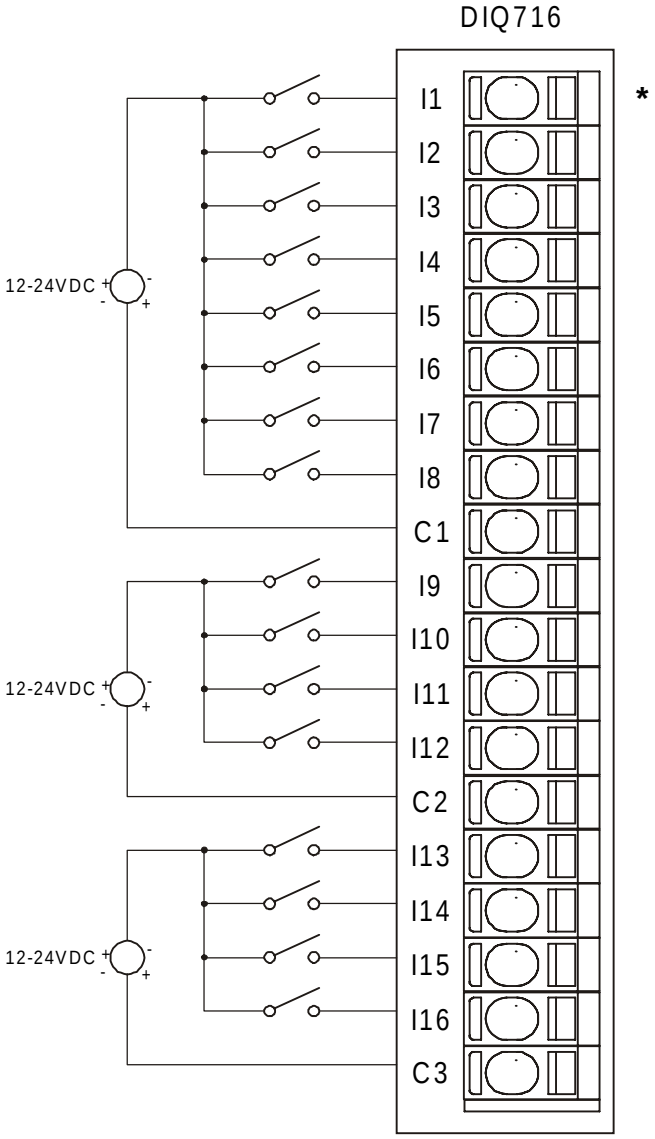


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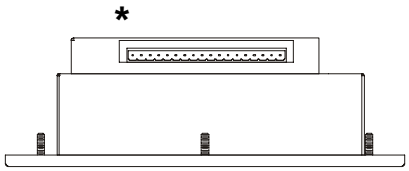
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# 2 WIRING

## *2.1 Input Wiring*




| Pin | Signal DIQ716 INPUT |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C1 | Common 1 (Isolated) |
| I9 | Input 9 |
| I10 | Input 10 |
| I11 | Input 11 |
| I12 | Input 12 |
| C2 | Common 2 (Isolated) |
| I13 | Input 13 |
| I14 | Input 14 |
| I15 | Input 15 |
| I16 | Input 16 |
| C3 | Common 3 (Isolated) |

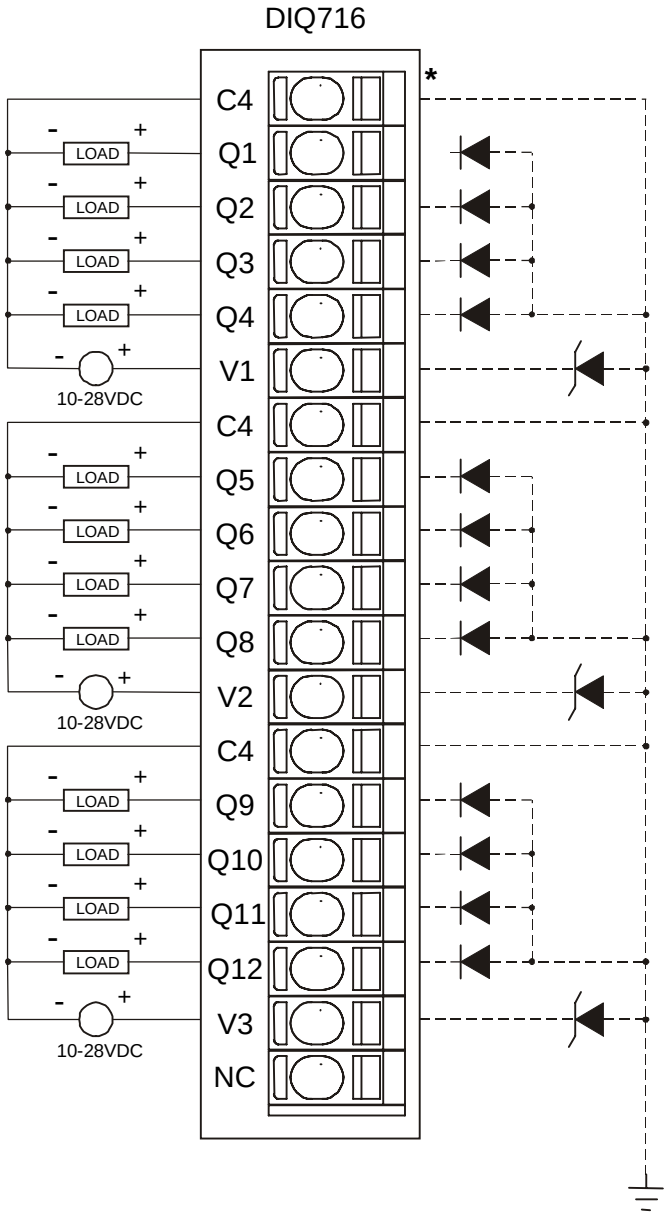



**OCS Top View – Shows Corresponding I/O pin location**

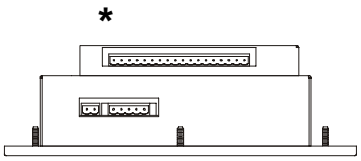


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*2.2 Output Wiring*




| Pin | Signal DIQ716 OUTPUT |
|---|---|
| C4 | Common |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| V1 | Load Power 1 |
| C4 | Common |
| Q5 | Output 5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| V2 | Load Power 2 |
| C4 | Common |
| Q9 | Output 9 |
| Q10 | Output 10 |
| Q11 | Output 11 |
| Q12 | Output 12 |
| V3 | Load Power |
| NC | No Connection |

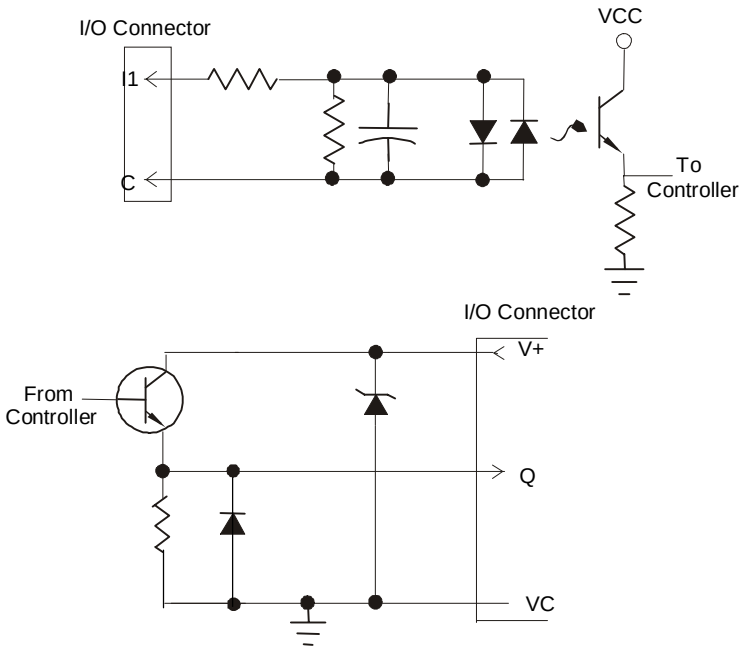



**OCS Bottom View – Shows corresponding I/O pin location**



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## 3 INTERNAL CIRCUIT SCHEMATIC




## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

> **Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

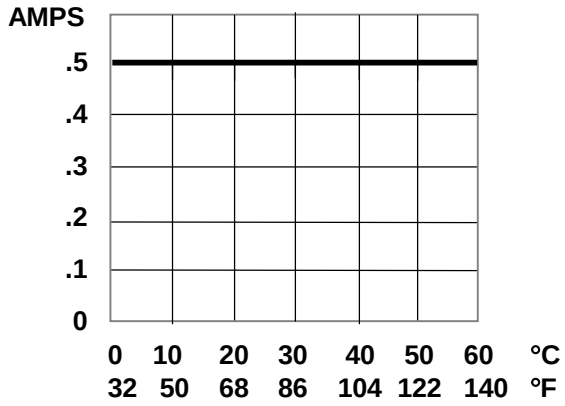
For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.



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# 6 OUTPUT CHARACTERISTICS

## Derating Chart for HE800DIQ716




# 7 TECHNICAL ASSISTANCE

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# AC Input /AC Output Module

**IC300DIQ522 / IC300DIQ622**
**120 VAC In, Positive Logic**
**3A Relay Out**

## 1 SPECIFICATIONS

| INPUT | DIQ522 | DIQ622 |
|---|---|---|
| Inputs per Module | 4 | 8 |
| Commons per Module | 1 | |
| Input Voltage Range | 120 – 160 VAC | |
| Peak Voltage | 160VAC | |
| AC Frequency | 60Hz | |
| ON Voltage Level | 70VAC Min. | |
| OFF Voltage level | 30VAC Max. | |

| | DIQ522 | DIQ622 |
|---|---|---|
| Input Impedance | 0.01µF +10K | |
| Isolation ( Channel to Bus) | 500VDC | |
| Minimum ON Current | 1mA. | |
| Maximum OFF Current | 200µA. | |
| OFF to ON Response | 50ms. | |
| ON to OFF Response | 50ms. | |
| Status Indicator | 4 | 8 |

| OUTPUT | DIQ522 | DIQ622 |
|---|---|---|
| Outputs per Module | 3 relay | 6 relay |
| Commons per Module | 1 | 2 |
| Output Type | Relay | |
| Coil Voltage | 18-30VDC | |
| Contact Voltage | 250VAC / 30VDC Max. | |
| ON Voltage drop | .1V Max. | |
| Fuses | 10A common | |
| Maximum Load current (resistive) | 3A | |

| | DIQ522 | DIQ622 |
|---|---|---|
| Maximum Leakage Current | 5µA | |
| Maximum Inrush Current | 3A | |
| Minimum Load | None | |
| OFF to ON Response | 6ms. Typical | |
| ON to OFF Response | .3ms. Typical | |
| Status Indicator | 3 | 6 |
| Isolation (Channel to bus) | 500VDC | |

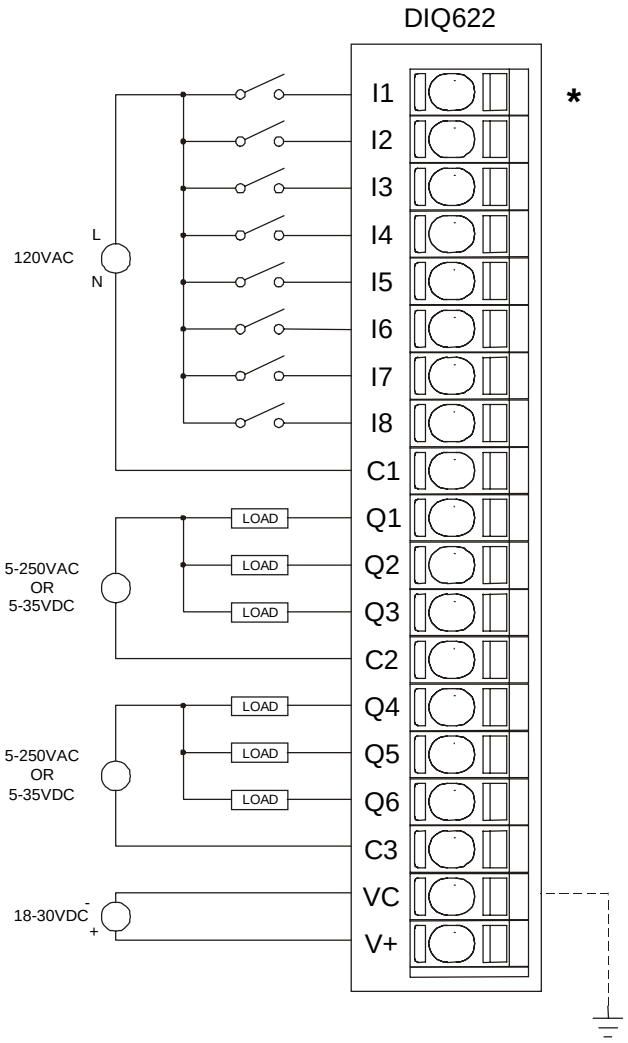
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.06 (2.75 @ 24VDC) | CE Rating | See GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Operating Temperature Code T4A; Also refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9oz. |



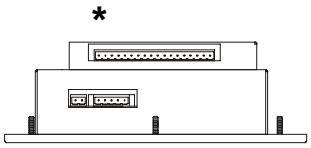
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## 2 WIRING




| Pin | Signal | |
|---|---|---|
| | DIQ622 | DIQ522 |
| I1 | Input 1 | Input 1 |
| I2 | Input 2 | Input 2 |
| I3 | Input 3 | Input 3 |
| I4 | Input 4 | Input 4 |
| I5 | Input 5 | No Connection |
| I6 | Input 6 | No Connection |
| I7 | Input 7 | No Connection |
| I8 | Input 8 | No Connection |
| C1 | Common 1 | |
| Q1 | Output 1 | Output 1 |
| Q2 | Output 2 | Output 2 |
| Q3 | Output 3 | Output 3 |
| C2 | Common 2 | |
| Q4 | Output 4 | No Connection |
| Q5 | Output 5 | No Connection |
| Q6 | Output 6 | No Connection |
| C3 | Common 3 | No Connections |
| VC | Relay Coil Voltage Common | |
| V+ | Relay Coil Voltage + | |

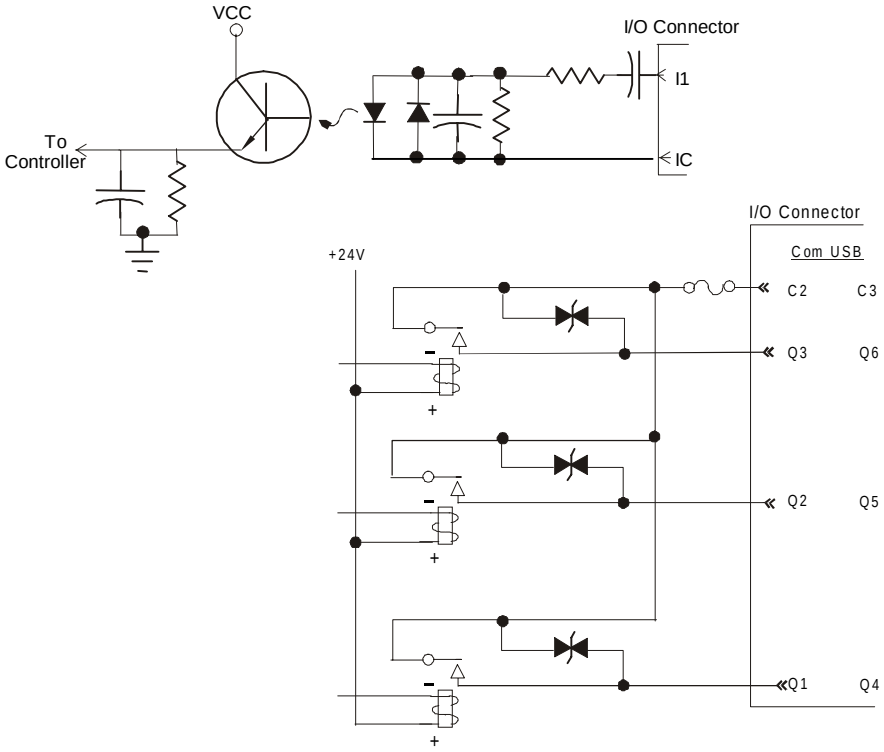



**OCS Bottom View – Shows corresponding I/O pin location**



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# 3 INTERNAL CIRCUIT SCHEMATICS




# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.


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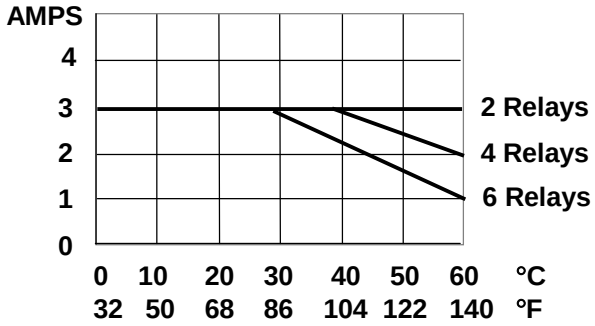
## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ522 / 622**




| Typical Relay Life (DIQ522 / 622) | | | |
|---|---|---|---|
| **Voltage (Resistive)** | **Load Current** | | |
| | **1 Amp** | **2 Amp** | **3 Amp** |
| 30VDC | 600K | 250K | 125K |
| 125VAC | 750K | 300K | 150K |
| 250VAC | 500K | 200K | 100K |

## 7 TECHNICAL SUPPORT

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# AC Input /AC Output Module

**IC300DIQ722**
**120 VAC In, Positive Logic**
**3A Relay Out**

## 1 SPECIFICATIONS

| INPUT | DIQ722 | | DIQ722 |
|---|---|---|---|
| Inputs per Module | 14 | Input Impedance | 0.01µF +10K |
| Commons per Module | 3 | Isolation ( Channel to Bus) | 500VDC |
| Input Voltage Range | 120 – 160 VAC | Minimum ON Current | 1mA. |
| Peak Voltage | 160VAC | Maximum OFF Current | 200µA. |
| AC Frequency | 60Hz | OFF to ON Response | 50ms. |
| ON Voltage Level | 70VAC Min. | ON to OFF Response | 50ms. |
| OFF Voltage level | 30VAC Max. | | |

| OUTPUT | DIQ722 | | DIQ722 |
|---|---|---|---|
| Outputs per Module | 10 relay | Maximum Leakage Current | 5µA |
| Commons per Module | 2 | Maximum Inrush Current | 3A |
| Output Type | Relay | Minimum Load | None |
| Coil Voltage | 18-30VDC | OFF to ON Response | 6ms. Typical |
| Contact Voltage | 250VAC / 30VDC Max. | ON to OFF Response | .3ms. Typical |
| ON Voltage drop | 0.2VDC max. | Isolation (Channel to bus) | 500VDC |
| Fuses | 10A common | | |
| Maximum Load current (resistive) | 3A | | |

| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | .17W(7mA @ 24VDC) | CE Rating | Pending |
| Required Power (Inrush) | Negligible | UL | Pending |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. |

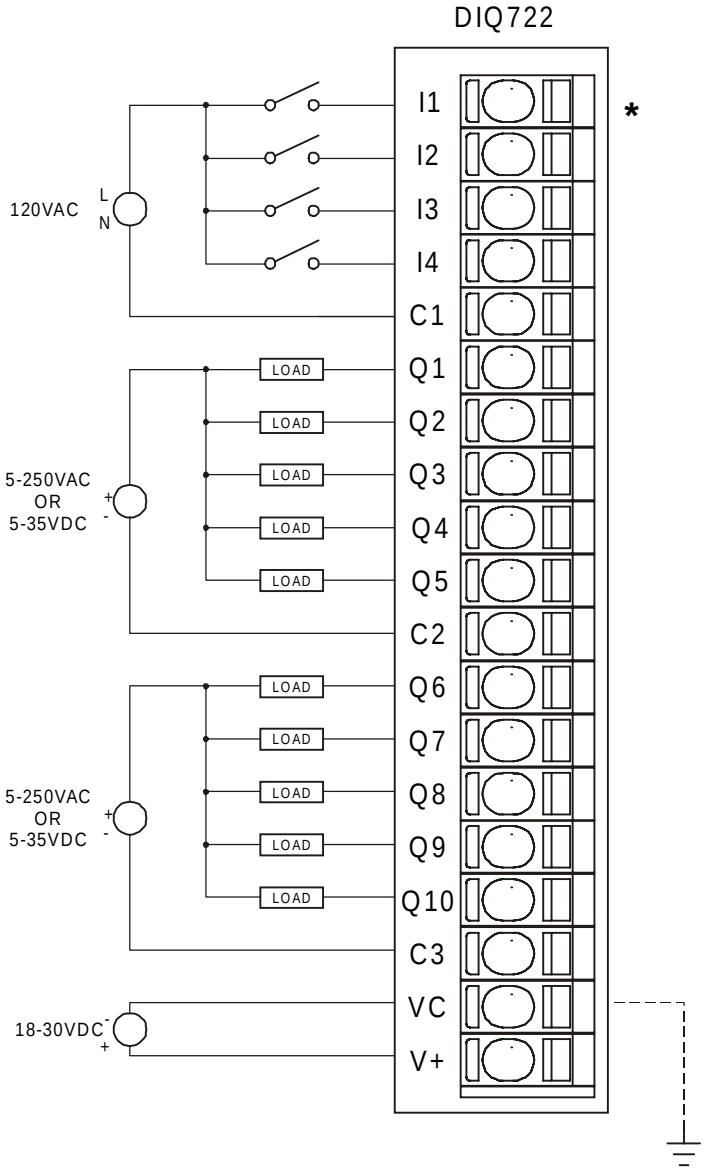
**GFK-1727**

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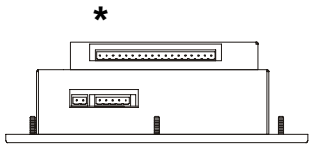
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# 2 WIRING

## 2.1 Input / Output Connector Wiring




| Pin | Signal |
|---|---|
| | **DIQ722** |
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| C1 | Common for Inputs1,2,3,4 |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| Q5 | Output 5 |
| C2 | Common for Outputs 1,2,3,4,5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| Q9 | Output 9 |
| Q10 | Output 10 |
| C3 | Common for Outputs 6,7,8,9,10 |
| VC | Relay Coil power common, connected to bus common internally. |
| V+ | Relay Coil power + 18 to +30VDC, 90mA max. |

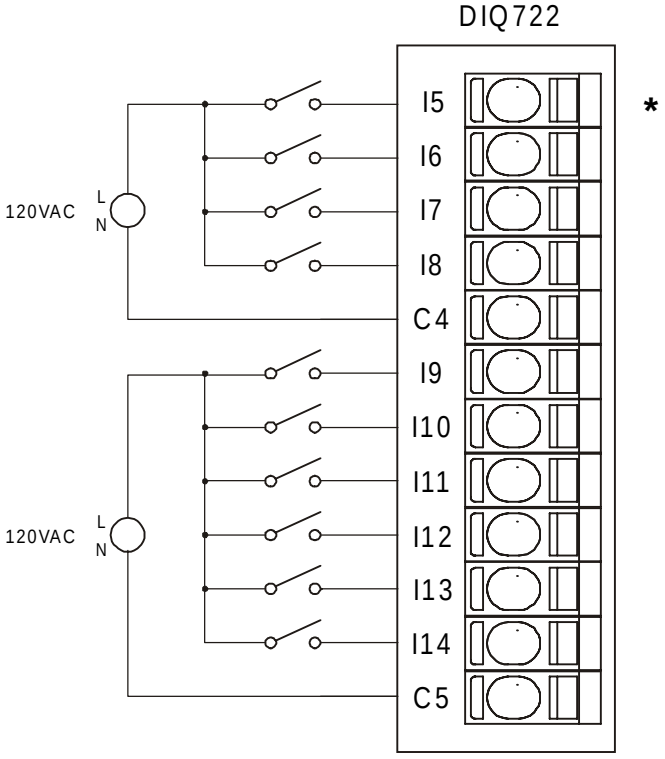



**OCS Bottom View – Shows corresponding I/O pin location**

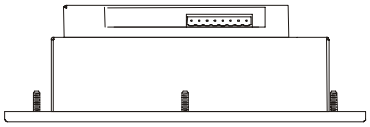

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## 2.2 Input Connector Wiring

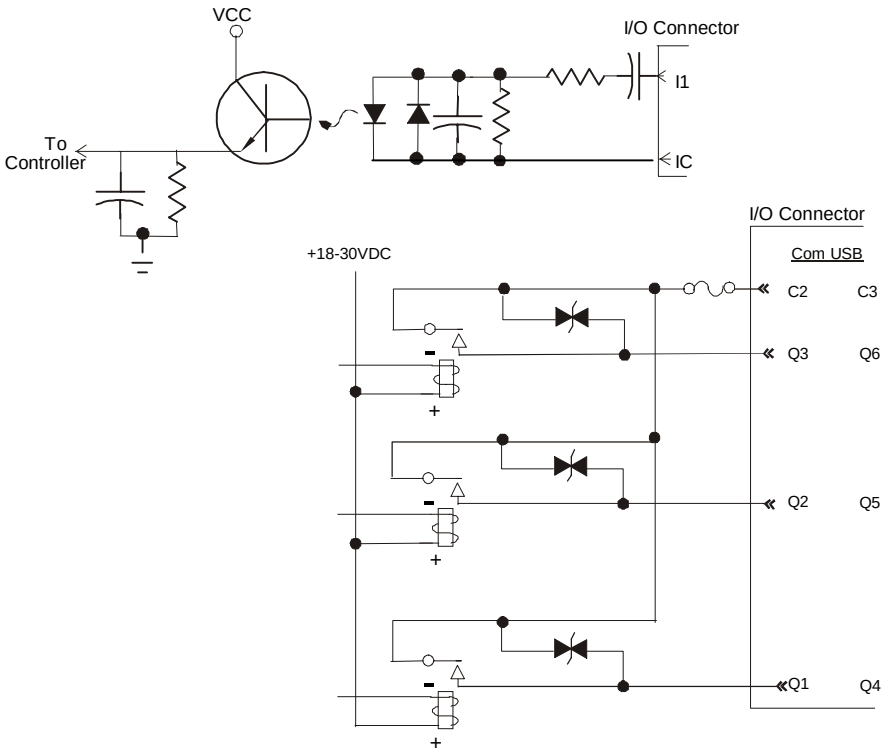



| Pin | Signal DIQ722 |
|---|---|
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C4 | Common for Inputs 5,6,7,8 |
| I9 | Input 9 |
| I10 | Input 10 |
| I11 | Input 11 |
| I12 | Input 12 |
| I13 | Input 13 |
| I14 | Input 14 |
| C5 | Common for Inputs 9,10,11,12,13,14 |




**OCS Top View – Shows corresponding I/O pin location**

# 3 INTERNAL CIRCUIT SCHEMATICS






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# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

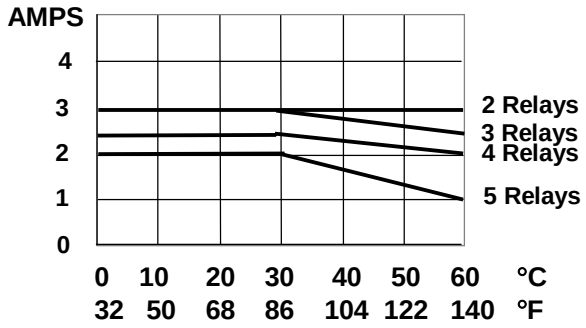
# 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

# 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ722**
**(Each group of 5)**





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| Typical Relay Life (DIQ722) | | | | |
|---|---|---|---|---|
| **Voltage (Resistive)** | **No Load** | **Load Current** | | |
| | | **1 Amp** | **2 Amp** | **3 Amp** |
| 30VDC | 20 Million | 600K | 250K | 125K |
| 125VAC | | 750K | 300K | 150K |
| 250VAC | | 500K | 200K | 100K |

## 7 TECHNICAL SUPPORT

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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**NOTES**


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# AC Input /AC Output Module

**IC300DIQ524 / IC300DIQ624**
**120 VAC In, Positive Logic**
**80-240 VAC Out, Positive Logic**

## 1 SPECIFICATIONS

| INPUT | DIQ524 | DIQ624 |
|---|---|---|
| Inputs per Module | 4 | 8 |
| Commons per Module | 1 | 1 |
| Input Voltage Range | 120 – 160 VAC | |
| Peak Voltage | 160VAC | |
| AC Frequency | 60Hz | |
| ON Voltage Level | 70VAC Min. | |
| OFF Voltage level | 30VAC Max. | |

| | DIQ524 | DIQ624 |
|---|---|---|
| Input Impedance | 0.01µF +10K | |
| Isolation ( Channel to Bus) | 500VDC | |
| Minimum ON Current | 1ms. | |
| Maximum OFF Current | 1ms. | |
| OFF to ON Response | 50ms. | |
| ON to OFF Response | 50ms. | |
| Status Indicator | 4 | 8 |

| OUTPUT | DIQ524 | DIQ624 |
|---|---|---|
| Outputs per Module | 4 | 8 |
| Commons per Module | 1 | 1 |
| Operating voltage | 260VAC Max. | |
| Output Type | MOSFET | |
| Contact Voltage | 260VAC Max. | |
| ON Voltage level | 1V Max. | |
| Isolation (Channel to bus) | 500VDC | |

| | DIQ524 | DIQ624 |
|---|---|---|
| Maximum Load Current | .3A Max. | |
| Maximum Leakage Current | 15µA Max. | |
| Maximum Inrush Current | 500mA | |
| OFF to ON Response | 10ms. Max. | |
| ON to OFF Response | 3ms. Max. | |
| Status Indicator | 4 | 8 |

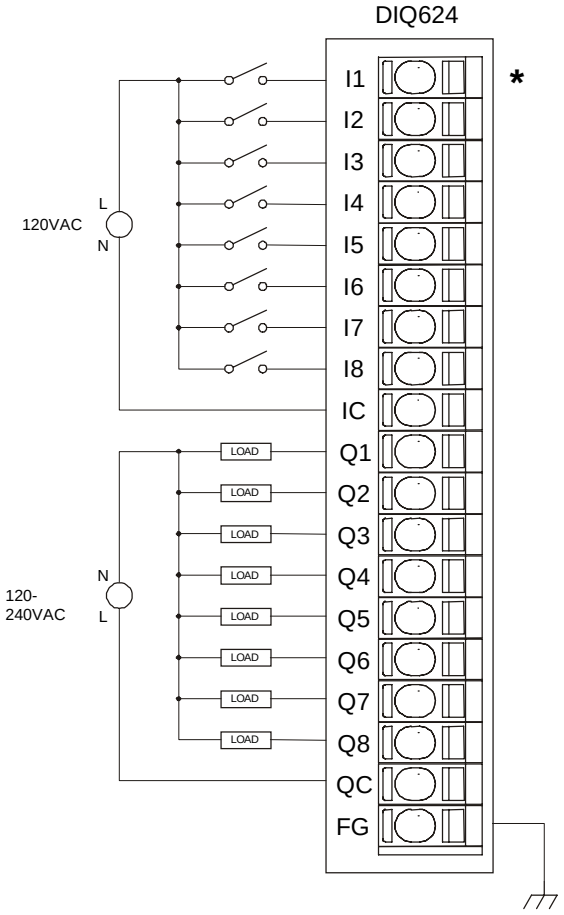
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.18W (7.7mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (256 g) |

**GFK-1612A**

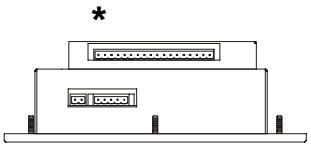
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## 2 WIRING

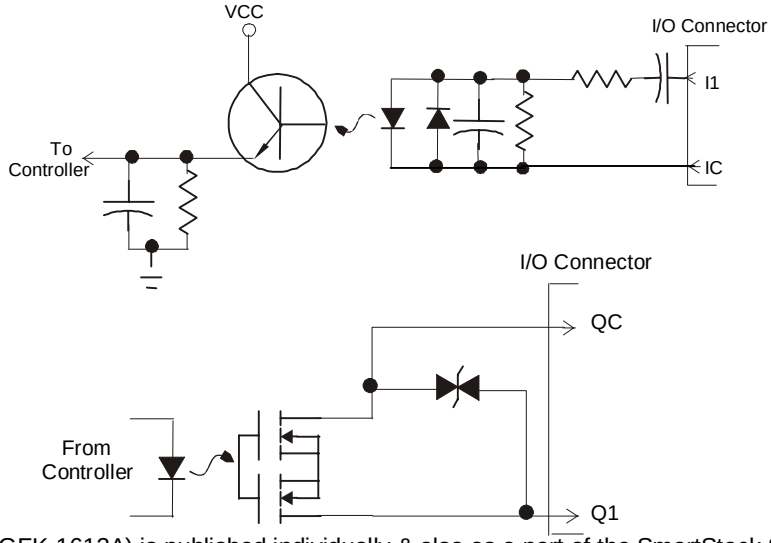



| Pin | Signal | |
|---|---|---|
| | DIQ624 | DIQ524 |
| I1 | Input 1 | Input 1 |
| I2 | Input 2 | Input 2 |
| I3 | Input 3 | Input 3 |
| I4 | Input 4 | Input 4 |
| I5 | Input 5 | No Connection |
| I6 | Input 6 | No Connection |
| I7 | Input 7 | No Connection |
| I8 | Input 8 | No Connection |
| IC | Input Common | |
| Q1 | Output 1 | Output 1 |
| Q2 | Output 2 | Output 2 |
| Q3 | Output 3 | Output 3 |
| Q4 | Output 4 | Output 4 |
| Q5 | Output 5 | No Connection |
| Q6 | Output 6 | No Connection |
| Q7 | Output 7 | No Connection |
| Q8 | Output 8 | No Connection |
| QC | Output Common | |
| FG | Frame Ground | |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATICS




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## 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

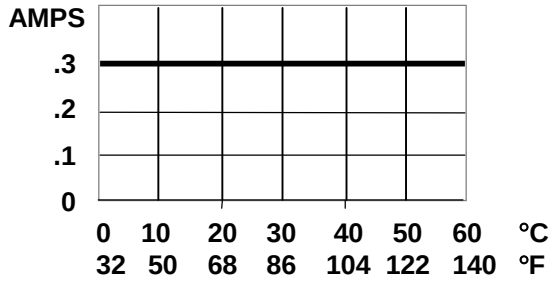
## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ524 / 624**




## 7 TECHNICAL ASSISTANCE

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# High Density
# Mixed DC I/O Module

**IC300DIQ935**
**24 Vdc In, Positive Logic**
**24Vdc Out, Negative Logic**
**50mA Maximum, Non-Inductive**

The High Density Mixed DC I/O Module (IC300DIQ935) is used for applications requiring a high number of digital connections and relatively low current such as LED panels and Annunciator panels. Because of the high density of the module, the I/O connectors required are high density D-subs. A list of required parts and supplier information is provided under *Installation/Safety*.

## 1 SPECIFICATIONS

| INPUT | DIQ935 | | DIQ935 |
|---|---|---|---|
| Inputs per Module | 32 | Input Impedance | 6K Ohms |
| Input Voltage | 24 VDC | Minimum ON Current | 3mA |
| Peak Voltage | 35 VDC Max. | Maximum OFF Current | 1mA |
| ON Voltage Level | 18 VDC | OFF to ON Response | 1ms. |
| OFF Voltage Level | 6 VDC | ON to OFF Response | 1ms. |

| OUTPUT | DIQ935 | | DIQ935 |
|---|---|---|---|
| Outputs per Module | 40 | Maximum Leakage Current | 100µA |
| Operating Voltage | 5 - 35VDC | Maximum Load Current | 50mA Max., Non-Inductive |
| Output Type | Sinking | Maximum Inrush Current | 500mA. |
| Peak Voltage | 35VDC Max. | Minimum Load | None |
| ON Voltage Level | 1.5VDC Max. | OFF to ON Response | 1ms. |
| Output Characteristics | Current Sinking | ON to OFF Response | 1ms. |

| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | .12W (5mA @ 24VDC) | CE Rating | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | High Density D-Sub |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5oz. |

**GFK-1647A**

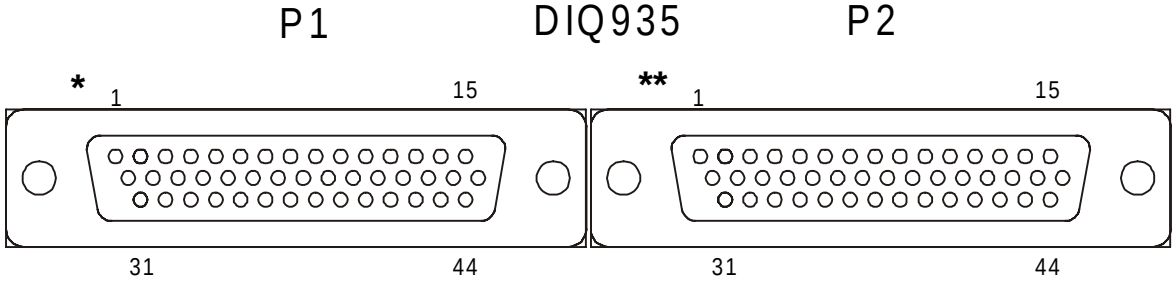

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## 2 WIRING

**Note: Read the Wiring Note that follows the P1 and P2 pin-outs *prior* to wiring the system.**

| DIQ935 INPUT Connector (P1) | | | | | | |
|---|---|---|---|---|---|---|
| | **Pin** | **Signal** | **Pin** | **Signal** | **Pin** | **Signal** |
| * | **1** | Input Common | **16** | Input Common | **31** | Input Common |
| | **2** | Input 1 | **17** | Input Common | **32** | Input 2 |
| | **3** | Input 4 | **18** | Input 3 | **33** | Input 5 |
| | **4** | Input 7 | **19** | Input 6 | **34** | Input 8 |
| | **5** | Input 10 | **20** | Input 9 | **35** | Input 11 |
| | **6** | Input 13 | **21** | Input 12 | **36** | Input 14 |
| | **7** | Input 16 | **22** | Input 15 | **37** | Input 17 |
| | **8** | Input 19 | **23** | Input 18 | **38** | Input 20 |
| | **9** | Input 22 | **24** | Input 21 | **39** | Input 23 |
| | **10** | Input 25 | **25** | Input 24 | **40** | Input 26 |
| | **11** | Input 28 | **26** | Input 27 | **41** | Input 29 |
| | **12** | Input 31 | **27** | Input 30 | **42** | Input 32 |
| | **13** | No Connection | **28** | No Connection | **43** | No Connection |
| | **14** | No Connection | **29** | No Connection | **44** | No Connection |
| | **15** | No Connection | **30** | No Connection | | |

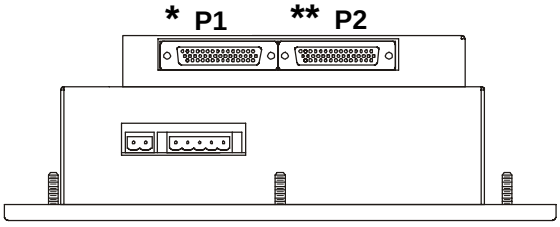



**OCS Bottom View – Shows corresponding I/O pin location**

| DIQ935 OUTPUT Connector (P2) | | | | | | |
|---|---|---|---|---|---|---|
| | **Pin** | **Signal** | **Pin** | **Signal** | **Pin** | **Signal** |
| ** | **1** | Output Common | **16** | Output Common | **31** | Output Common |
| | **2** | Output 1 | **17** | Output Common | **32** | Output 2 |
| | **3** | Output 4 | **18** | Output 3 | **33** | Output 5 |
| | **4** | Output 7 | **19** | Output 6 | **34** | Output 8 |
| | **5** | Output 10 | **20** | Output 9 | **35** | Output 11 |
| | **6** | Output 13 | **21** | Output 12 | **36** | Output 14 |
| | **7** | Output 16 | **22** | Output 15 | **37** | Output 17 |
| | **8** | Output 19 | **23** | Output 18 | **38** | Output 20 |
| | **9** | Output 22 | **24** | Output 21 | **39** | Output 23 |
| | **10** | Output 25 | **25** | Output 24 | **40** | Output 26 |
| | **11** | Output 28 | **26** | Output 27 | **41** | Output 29 |
| | **12** | Output 31 | **27** | Output 30 | **42** | Output 32 |
| | **13** | Output 34 | **28** | Output 33 | **43** | Output 35 |
| | **14** | Output 37 | **29** | Output 36 | **44** | Output 38 |
| | **15** | Output 40 | **30** | Output 39 | | |



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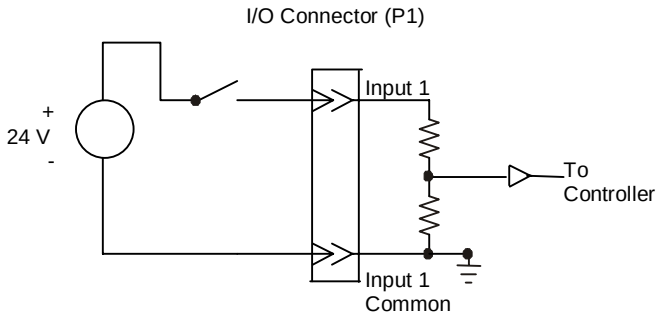


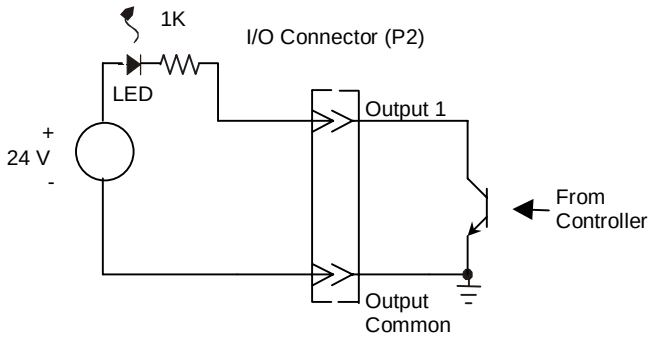

**OCS Bottom View – Shows corresponding I/O pin location**

**Wiring Note**

The IC300DIQ935 has two 44-pin connectors. There is an input connector (P1) and an output connector (P2). **All four ground pins on each of the connectors need to be returned directly to the I/O power supply ground connection.**

## 3 INTERNAL CIRCUIT SCHEMATIC





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# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default states of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

**Warning:** The default turns the outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

# 5 INSTALLATION / SAFETY

All applicable codes and standards should be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

Because of the high density of the module, the I/O connectors required are high density D-subs. The D-sub connectors and pins can be obtained from a variety of sources including Digi-Key Corporation (1-800-344-4539). The part numbers are:

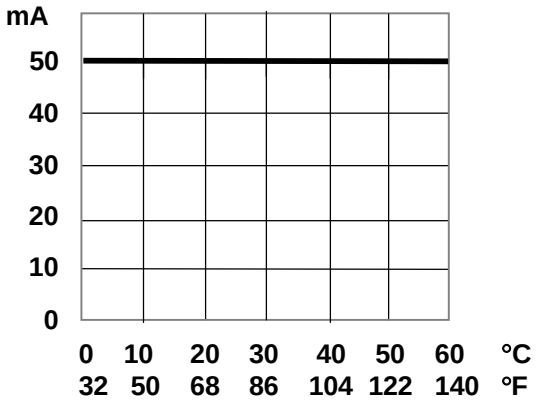
| Description | Manufacturer | Manufacturer Part # | Digi-Key Part # |
|---|---|---|---|
| **D-Sub Connector 44 (Male)** | AMP | 748366-1 | A2078-ND |
| **D-Sub Pin for D-Sub Connector (22-28 AWG), 30µ Gold** | AMP | 748333-4 | A2088-ND |



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# 6 OUTPUT CHARACTERISTICS

**Derating Chart for DIQ935**




# 7 TECHNICAL ASSISTANCE

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# +/- 10V Analog Input Module

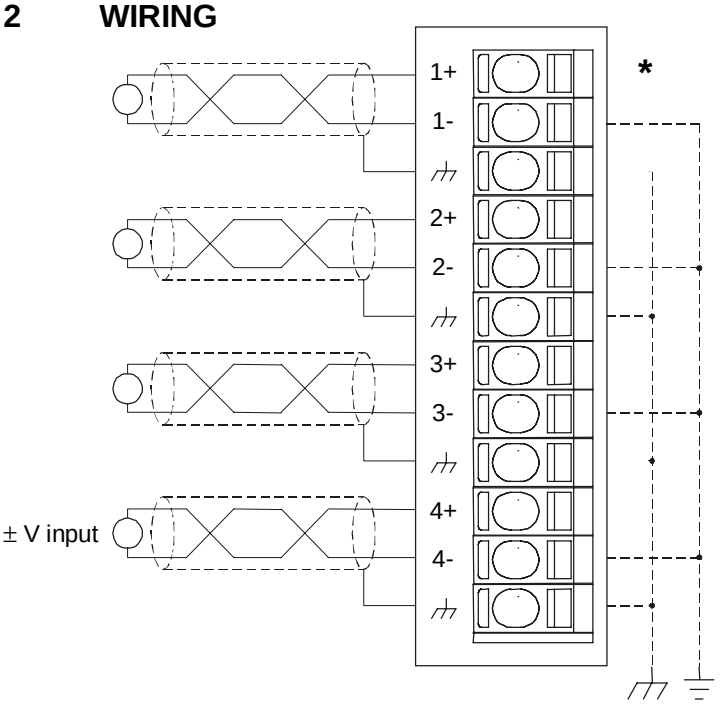
**IC300ADC010 / IC300ADC110**
**12-Bit Resolution**

## 1 SPECIFICATIONS

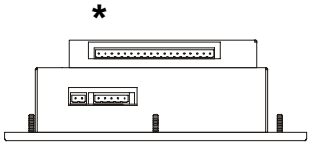
| | ADC010 | ADC110 |
|---|---|---|
| Number of Channels | 2 | 4 |
| Input Ranges (Including over-range) | ±10.23VDC; ±5.11, 0 - +10.23, 0 - +5.11 | |
| Resolution | 12-Bit | |
| Input Impedance | 10Meg Ohm <12VDC or 6Meg Ohm >12VDC Nom. | |
| Usable Resolution | 12-Bits | |
| Maximum Error | .05% Full Scale | |
| Required Power (Steady State) | .09W (4.1mA @ 24VDC) | |
| Required Power (Inrush) | Negligible | |
| Maximum Over-Voltage | 350VDC Max. | |
| Digital Filtering | Yes | |
| Conversion Time (PLC Update Rate) | Set by PLC Scan Time | |

| | ADC010 | ADC110 |
|---|---|---|
| Analog Inputs Input Points Required | 2 | 4 |
| Power Budget Requirement | Internal 35mA | |
| Converter Type | Successive Approximation | |
| Operating Temperature | 0° to 60° Celsius | |
| External Power Supply | None | |
| Relative Humidity | 5 to 95% Non-condensing | |
| Accuracy vs. Temperature | .005% / °C | |
| CE Rating | Refer to GFK-1755 | |
| UL | Refer to GFK-1754 | |
| Terminal Type | Spring Clamp, Removable | |
| Weight | 9 oz. (256 g) | |

## 2 WIRING




| | Signal | |
|---|---|---|
| | ADC110 | ADC010 |
| 1+ | Channel 1+ | Channel 1+ |
| 1- | Common | Common |
| ⏚ | Shield | Shield |
| 2+ | Channel 2+ | Channel 2+ |
| 2- | Common | Common |
| ⏚ | Shield | Shield |
| 3+ | Channel 3+ | |
| 3- | Common | |
| ⏚ | Shield | |
| 4+ | Channel 4+ | |
| 4- | Common | |
| ⏚ | Shield | |



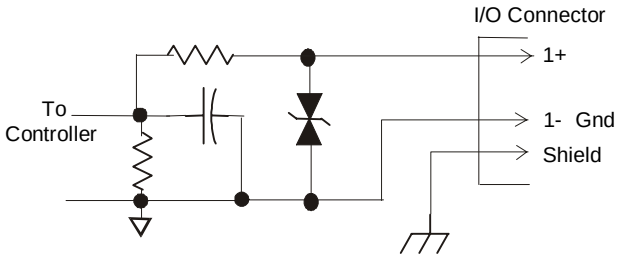

**OCS Bottom View – Shows corresponding I/O pin location**

**GFK-1614A**

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# 3 INTERNAL CIRCUIT SCHEMATIC



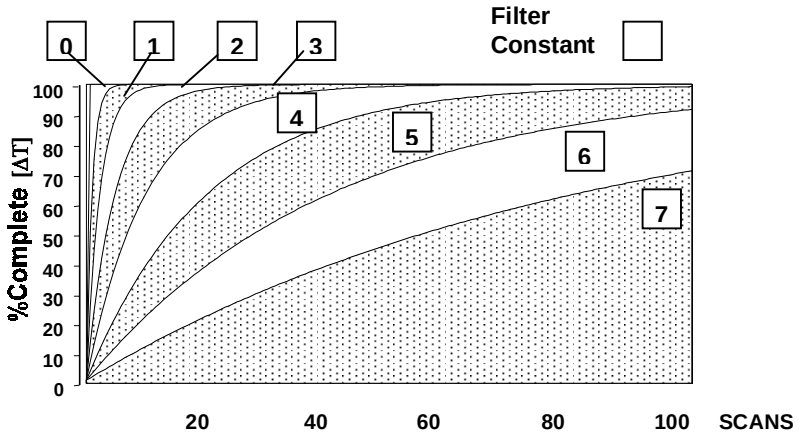

# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

**Module Setup Tab**

a. Input range for each channel may be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.




***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Fillter Constant) on module response to a temperature change.



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## 5 INPUT CONVERSION FACTOR

The following table describes how real-world inputs are scaled into the controller. Given a known input voltage, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Voltage In (Vin) / Conversion Factor**

**Example:** The user selects a voltage range of 0 - +5 VDC:

1. The known input voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of 0 - +5 VDC is .00015625.
3. To determine the data value, the formula is used:
   Data = Vin / Conversion Factor
   19200 = 3 VDC / .00015625

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Range** | **Voltage In (Vin) VDC** | **Data Out** | **Conversion Factor** |
| 0 - +5.00 VDC | +5.11 | 32704 | .00015625 |
| | +5.00 | 32000 | |
| | 0.00 | 0 | |
| | NA | NA | |
| | NA | NA | |
| 0 - +10.00 VDC | +10.23 | 32736 | .0003125 |
| | +10.00 | 32000 | |
| | 0.00 | 0 | |
| | NA | NA | |
| | NA | NA | |
| +/-5.00 VDC | +5.11 | 32704 | .00015625 |
| | +5.00 | 32000 | |
| | 0 | 0 | |
| | -5.00 | -32000 | |
| | -5.11 | -32704 | |
| +/-10.00 VDC | +10.23 | 32736 | .0003125 |
| | +10.00 | 32000 | |
| | 0 | 0 | |
| | -10.00 | -32000 | |
| | -10.23 | -32736 | |

## 6 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (MAN0227). A handy checklist is provided that covers panel box layout requirements and minimum clearances.



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# 7 TECHNICAL ASSISTANCE

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# 4-20mA Analog Input Module

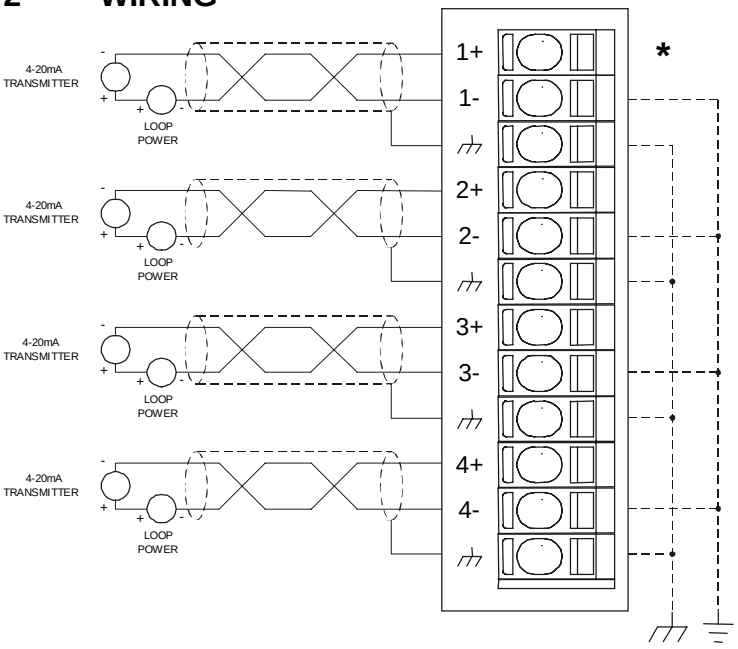
**IC300ADC020 / IC300ADC120**
**12-Bit Resolution**

## 1 SPECIFICATIONS

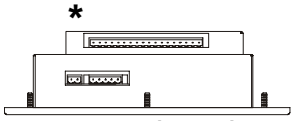
| | ADC020 | ADC120 |
|---|---|---|
| Number of Channels | 2 | 4 |
| Input Ranges (including over-range) | Nominal: 0-20.47mA, ±20.47mA, | |
| Resolution | 12-Bit | |
| Maximum Error | .05% Full Scale | |
| Input Impedance | 100 Ohm < 12VDC, Clamped @ 12VDC, 35mA Max. Continuous | |
| Input Current | 0-20mA (.48mA) | |
| Required Power (Steady State) | 0.09W (4.1mA @ 24VDC) | |
| Required Power (Inrush) | Negligible | |
| Maximum Over-Current | 35mA | |
| External Power Supply | None | |
| Weight | 9 oz. (256 g) | |

| | ADC020 | ADC120 |
|---|---|---|
| Converter Type | Successive Approximation | |
| Conversion Time (PLC Update Rate) | Set by PLC Scan Time | |
| Terminal Type | Spring Clamp, Removable | |
| Accuracy vs. Temperature | .005% / °C | |
| Analog Inputs Input Points Required | 2 | 4 |
| Power Budget Requirement | Internal 35mA | |
| Operating Temperature | 0° to 60° Celsius | |
| Relative Humidity | 5 to 95% Non-condensing | |
| CE | Refer to GFK-1755 | |
| UL | Refer to GFK-1754 | |

## 2 WIRING




| Pin # | ADC120 | ADC020 |
|---|---|---|
| 1+ | Channel 1+ | Channel 1+ |
| 1- | Common | Common |
| ⏚ | Shield | Shield |
| 2+ | Channel 2+ | Channel 2+ |
| 2- | Common | Common |
| ⏚ | Shield | Shield |
| 3+ | Channel 3+ | |
| 3- | Common | |
| ⏚ | Shield | |
| 4+ | Channel 4+ | |
| 4- | Common | |
| ⏚ | Shield | |




**OCS Bottom View – Shows corresponding I/O pin location**

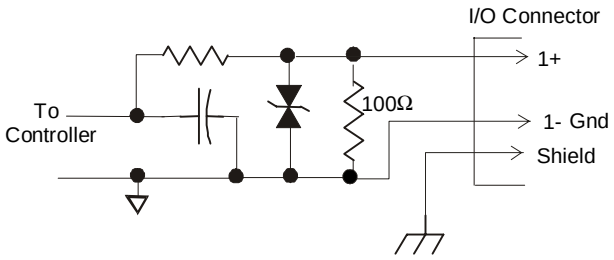
**GFK-1615A**

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## 3 INTERNAL CIRCUIT SCHEMATIC

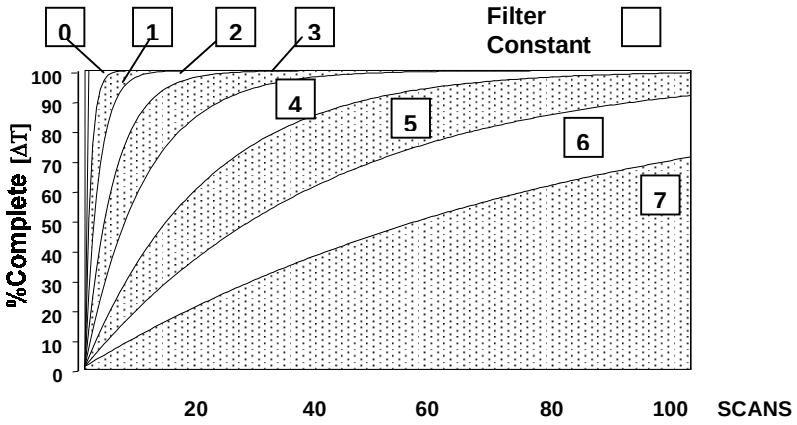



## 4 CONFIGURATION

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

**Module Setup Tab**

a. Input range for each channel may be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.




***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Filter Constant) on module response to a temperature change.


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## 5 INPUT CONVERSION FACTOR

The following table describes how real-world inputs are scaled into the controller. Given a known input current, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Input Current (mA) / Conversion Factor**

**Example:** The user selects a current range of 0 - +20mA:

1. The known input current is 14mA..
2. Using the table, the conversion factor for the current range of 0 - +20 VDC is .000625.
3. To determine the data value, the formula is used:
   Data = Input Current (mA) / Conversion Factor
   22400 = 14mA / .000625

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Current Range** | **Input Current (mA)** | **Data** | **Conversion Factor** |
| 0 – +20mA | +20.47 | 32752 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |
| -20 to +20mA | -20.00 | -32000 | .000625 |
| | -20.47 | -32752 | |

## 6 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 7 TECHNICAL ASSISTANCE

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# Thermistor / Current / Voltage Analog Input Module

**IC300ADC920**
**12-Bit Resolution**

## 1 SPECIFICATIONS

| | ADC920 | | ADC920 |
|---|---|---|---|
| Number of Channels | 12 | Converter Type | Successive Approximation |
| **Input Ranges (including over-range)**<br><br>*Thermistor* (1/10° resolution)<br><br>*Current*<br><br>*Voltage* | <br><br>-37 to 115°C<br>-35 to 240°F<br><br>0-20.47mA<br><br>0-5.11 VDC | **Input Impedance**<br><br>*Thermistor*<br><br>*Current*<br><br>*Voltage* | < 12VDC, Clamped @ 12VDC, 35mA Max. Continuous<br><br>10K ohms<br><br>250 ohms<br><br>1Megohm |
| Resolution | 12-Bit | Terminal Type | Spring Clamp, Removable |
| Maximum Error | TBA | Operating Temperature | 0° to 60° Celsius |
| Conversion Time (PLC Update Rate) | Set by PLC Scan Time | Analog Inputs Input Points Required | 12 |
| Accuracy vs. Temperature | TBA | Relative Humidity | 5 to 95% Non-condensing |
| Required Power (Steady State) | .19W (8mA @ 24VDC) | CE | Pending |
| Required Power (Inrush) | Negligible | UL | Pending |
| Maximum Over-Current | 35mA | Weight | 9 oz. (256 g) |
| External Power Supply | None | | |

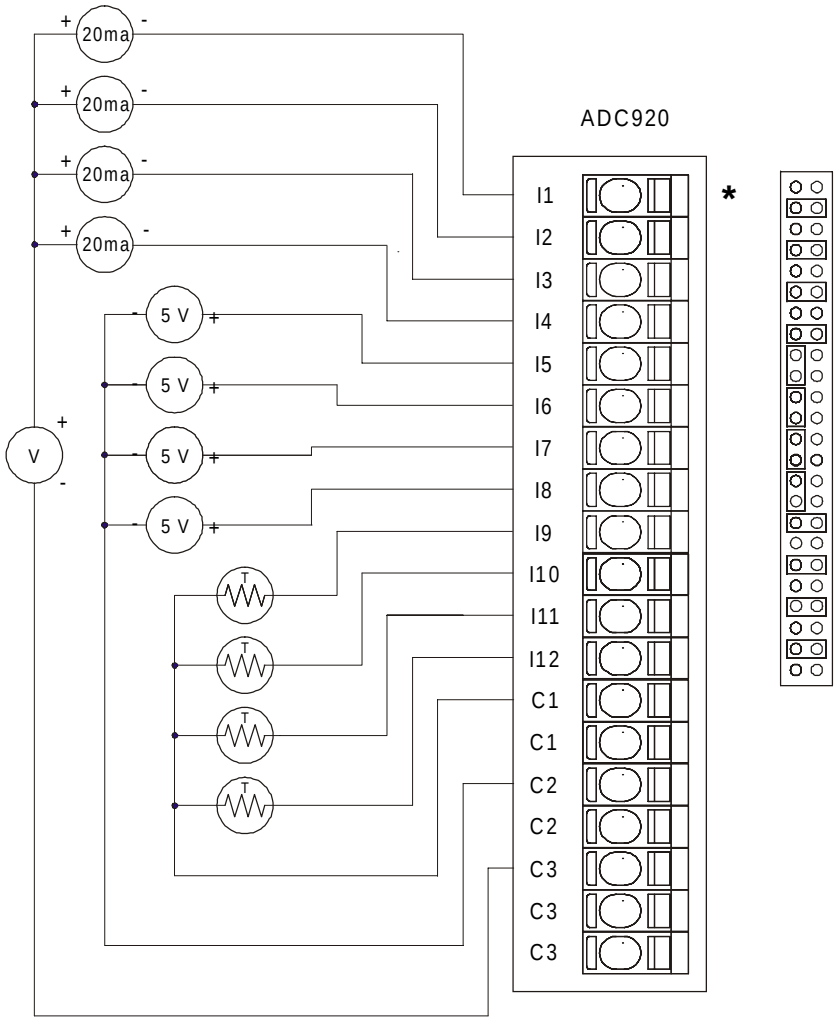
TBA=To Be Announced

**GFK-1725**

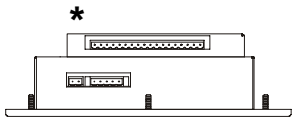

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## 2 WIRING




| Pin # | ADC920 |
|---|---|
| 1 | Input 1 |
| 2 | Input 2 |
| 3 | Input 3 |
| 4 | Input 4 |
| 5 | Input 5 |
| 6 | Input 6 |
| 7 | Input 7 |
| 8 | Input 8 |
| 9 | Input 9 |
| 10 | Input 10 |
| 11 | Input 11 |
| 12 | Input 12 |
| C1 | Thermistor Common |
| C1 | |
| C2 | 0 – 5VDC Common |
| C2 | |
| C3 | 20mA Common |
| C3 | |
| C3 | |

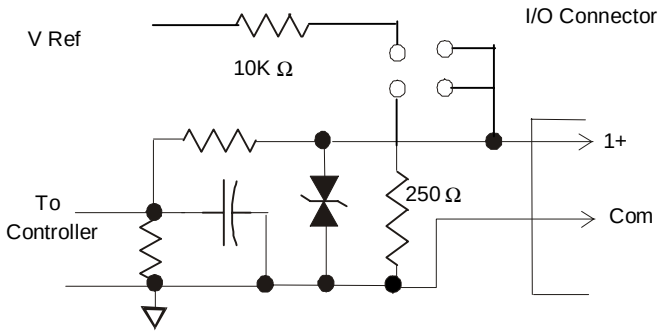



**OCS Bottom View – Shows corresponding I/O pin location**


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# 3 INTERNAL CIRCUIT SCHEMATIC




# 4 CONFIGURATION

## 4.1 Software Configuration

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

**I/O Map Tab**

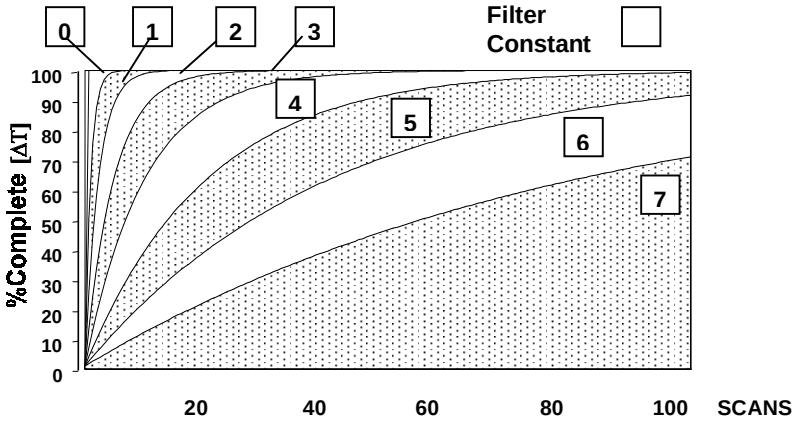
The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

**Module Setup Tab**

a. Input range for each channel may be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.
c. In addition to configuring the module setup, the hardware must be jumpered to select the appropriate range for each channel.


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***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Filter Constant) on module response to a temperature change.

### 4.2 Hardware Configuration

The inputs are referenced to the bus common. Each of the inputs can be jumper-selected for one of the three input types. Behind each of the input pins is a corresponding group of four jumper pins with a programming plug.

a. To select 5V input: Connect the two pins nearest the connector.
b. To select thermistor input: Connect the two pins nearest input 1.
c. To select 20mA input: Connect the two pins nearest input 12.

**Note:** It is also necessary to specify the input channel type in Cscape along with the temperature format.


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# 5 INPUT CONVERSION FACTOR

The following table describes how real-world inputs are scaled into the controller. Given a known input voltage, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Voltage In (Vin) / Conversion Factor**

**Example:** The user selects a voltage range of 0 - +5 VDC:

1. The known input voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of 0 - +5 VDC is .00015625.
3. To determine the data value, the formula is used:
   Data = Vin / Conversion Factor
   19200 = 3 VDC / .00015625

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Range** | **Voltage In (Vin) VDC** | **Data Out** | **Conversion Factor** |
| 0 - +5.00 VDC | +5.11 | 32704 | .00015625 |
| | +5.00 | 32000 | |
| | 0 | 0 | |
| | NA | NA | |
| | NA | NA | |
| 0 - +20mA | +20.47 | 32736 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |
| | NA | NA | |
| | NA | NA | |
| °C | +115 | 1150 | 0.1 |
| | 0 | 0 | |
| | -37 | -370 | |
| °F | +240 | 2400 | 0.1 |
| | 0 | 0 | |
| | -35 | -350 | |


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## 6 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 7 TECHNICAL ASSISTANCE

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# RTD Input Module

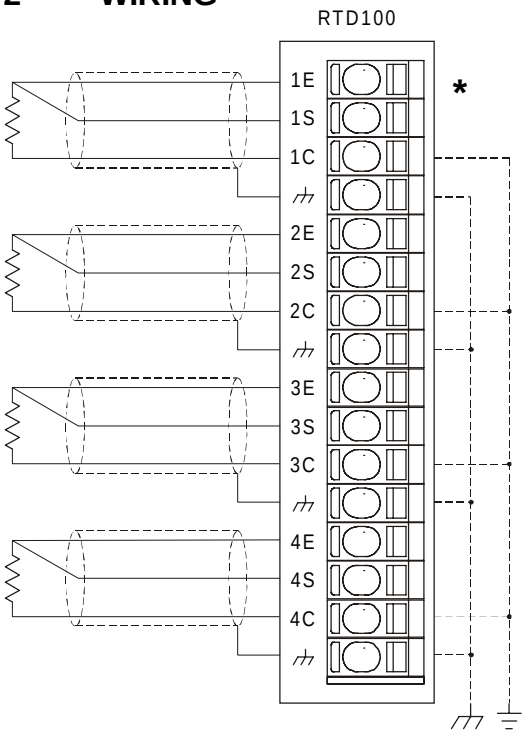
## IC300RTD000 / IC300RTD100

## 1 SPECIFICATIONS

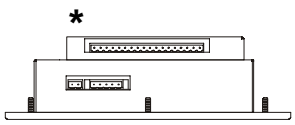
| | RTD000 | RTD100 |
|---|---|---|
| Number of Channels | 2 | 4 |
| RTD Types | 100, 200, 500, 1000 Ohms at 0°C, Platinum, Alpha 0.00385, DIN43760 | |
| Input Range | -200°C to +850°C | |
| Input Impedance | >100Meg Ohm 0-4VDC Clamped @ 0 and 4VDC | |
| RTD Excitation Current | 2.2, 1.1, 0.44, 0.22mA, 25% duty cycle | |
| RTD Short | Indefinite | |
| Channel-to-Channel Tracking | .1°C | |
| Update Time | 16 channels/second | |
| Input Transient Protection | Zener/Capacitor | |
| Notch Filter | 50-60 Hz. Software Selectable | |
| Resolution | .05°C | |
| Required Power (Steady State) | 0.10W (4.2mA @ 24VDC) | |

| | RTD000 | RTD100 |
|---|---|---|
| Required Power (Inrush) | Negligible | |
| Average RTD Current | .44mA (100 Ohm Range) | |
| I/O Points Required | 2 | 4 |
| Converter Type | Integrating | |
| Types Supported | DIN43760 | |
| Relative Humidity | 5 to 95% Non-condensing | |
| Operating Temperature | 0° to 60° Celsius | |
| CE | Refer to GFK-1755 | |
| UL | Refer to GFK-1754 | |
| Terminal Type | Spring Clamp, Removable | |
| Weight | 9.5 oz. (270 g) | |
| Accuracy | ± 0.5°C | |

## 2 WIRING




| Pin | Signal | |
|---|---|---|
| | RTD100 | RTD000 |
| 1E | RTD1 Excitation | RTD1 Excitation |
| 1S | RTD1 Sense | RTD1 Sense |
| 1C | RTD1 Common | RTD1 Common |
| ⏚ | Shield | Shield |
| 2E | RTD2 Excitation | RTD2 Excitation |
| 2S | RTD2 Sense | RTD2 Sense |
| 2C | RTD2 Common | RTD2 Common |
| ⏚ | Shield | Shield |
| 3E | RTD3 Excitation | |
| 3S | RTD3 Sense | |
| 3C | RTD3 Common | |
| ⏚ | Shield | |
| 4E | RTD4 Excitation | |
| 4S | RTD4 Sense | |
| 4C | RTD4 Common | |
| ⏚ | Shield | |




**OCS Bottom View – Shows corresponding I/O pin location**

**GFK-1616A**

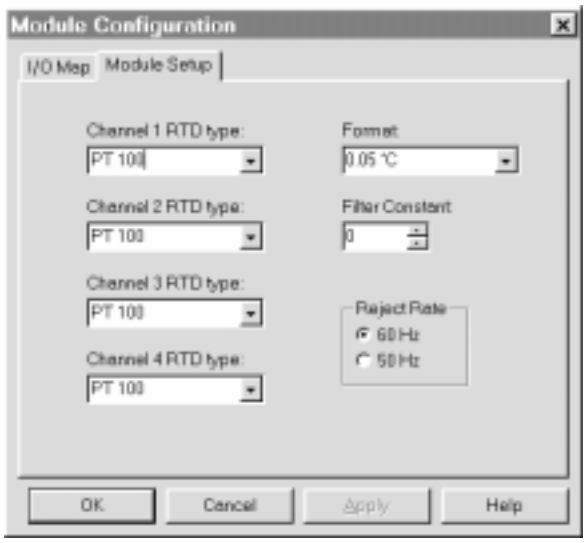
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# 3 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).




**Module Setup Tab**

a. Sensor Type for each channel may be selected independently.

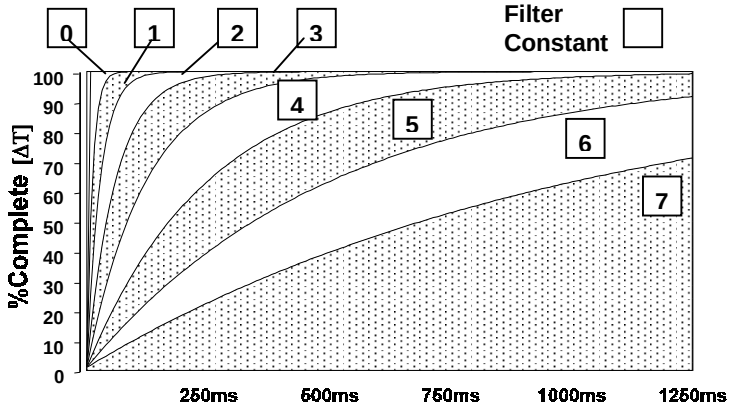
b. Temperature format may be set for various C° or F° ranges.

c. Filter Constant sets the level of digital filtering according to the chart below.

d. Reject Rates sets the frequency level for noise rejection at 50 or 60HZ.

**I/O Map Tab**

The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.




***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Filter Constant) on module response to a temperature change.



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## 4 TEMPERATURE CONVERSION

For a given module configuration, use the appropriate formula in the table to obtain the actual temperature (°C or °F) that is represented by the value in the %AI register.

| Module Configuration | Temperature Conversion | |
|---|---|---|
| | Celsius | Fahrenheit |
| 0.05° | °C = %AI / 20 | °F = %AI / 20 |
| 0.1° | °C = %AI / 10 | °F = %AI / 10 |
| 0.5° | °C = %AI / 2 | °F = %AI / 2 |

## 5 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.
e. Interposing electrical devices (such as relays) in the signal path can cause errors due to resistive imbalance.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 TECHNICAL SUPPORT

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# Thermocouple / Millivolt Input Module

**IC300THM000 / IC300THM100**

## 1 SPECIFICATIONS

| | THM000 | THM100 | | THM000 | THM100 |
|---|---|---|---|---|---|
| Number of Channels | 2 | 4 | PLC Update Rate | Set by PLC Scan Rate | |
| Resolution | .05°C | | Analog Input Points Required | 2 | 4 |
| Input Impedance | 10Meg Ohm clamped @ ±24VDC | | Operating Temperature | 0° to 60° Celsius | |
| A/D Conversion Type | Integrating | | Relative Humidity | 5 to 95% Non-condensing | |
| Required Power (Steady State) | 0.34W (14.3mA @ 24VDC) | | CE | Refer to GFK-1755 | |
| Required Power (Inrush) | Negligilble | | UL | Refer to GFK-1754 | |
| Types Supported | J,K,T,E | | Weight | 9.5 oz. (270 g) | |
| Millivolt Ranges | ±25mv, ±50mv, ±100mv | | Cold Junction | Internal or External; Automatically Selected | |
| Millivolt Accuracy | .1% Full Scale | | Input Range Temperature* | See Note at Bottom of Table | |
| Common Channel Points | None | | Maximum Sustained Differential O/L | Limited by Common Mode Range | |
| Common Mode Range | ± 12VDC Max. | | Open Thermocouple Response | High Temperature | |
| A/D Conversion Time | 16 channels per second | | | | |

| **Thermocouple Type:** | **J** | **K** | **T** |
|---|---|---|---|
| Input Range Temperature | -210°C to 770°C<br><br>(-346°F to 1418°F) | -270°C to 1380°C<br><br>(-454°F to 2516°F) | -270°C to 410°C<br><br>(-454°F to 770°F) |
| | **E** | **R** | **S** |
| | -270°C to 1010°C<br><br>(-454°F to 1850°F) | 0°C to 1760°C<br><br>(32°F to 3200°F) | 0°C to 1760°C<br><br>(32°F to 3200°F) |
| **Accuracy**<br><br>Types **J,K,T, & E**<br><br>Types **R & S** | <br><br>±1°C<br><br>±4°C | | |
| **Note:** Accuracy Specifications not guaranteed below –200°C. | | | |

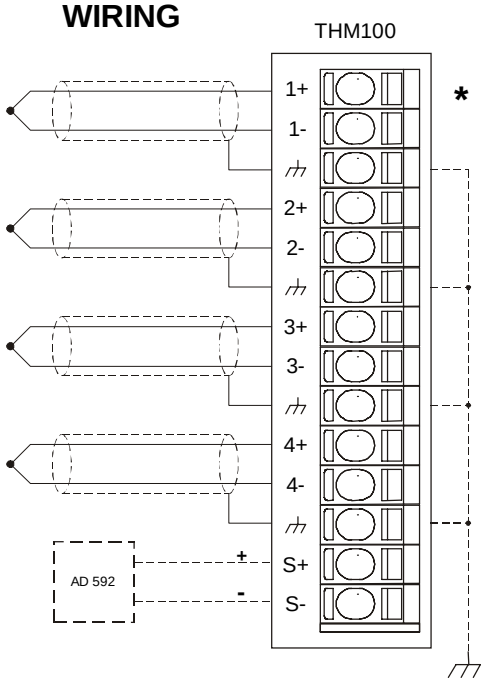
**GFK-1617A**

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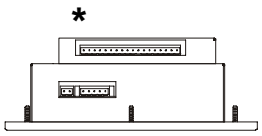
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## 2 WIRING




| Pin | Signal | |
|---|---|---|
| | THM100 | THM000 |
| 1+ | Thermocouple 1 + | Thermocouple 1 + |
| 1- | Thermocouple 1 - | Thermocouple 1 - |
| ⏚ | Shield | Shield |
| 2+ | Thermocouple 2 + | Thermocouple 2 + |
| 2- | Thermocouple 2 - | Thermocouple 2 - |
| ⏚ | Shield | Shield |
| 3+ | Thermocouple 3 + | |
| 3- | Thermocouple 3 - | |
| ⏚ | Shield | |
| 4+ | Thermocouple 4 + | |
| 4- | Thermocouple 4 - | |
| ⏚ | Shield | |
| S+ | External AD592 + | |
| S- | External AD592 - | |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

**Module Setup Tab**

a. Sensor Type for each channel must match what is physically attached.

b. Temperature format may be set for various C° or F° ranges. (This does not apply to millivolt ranges.

c. Filter Constant sets the level of digital filtering according to the chart below.

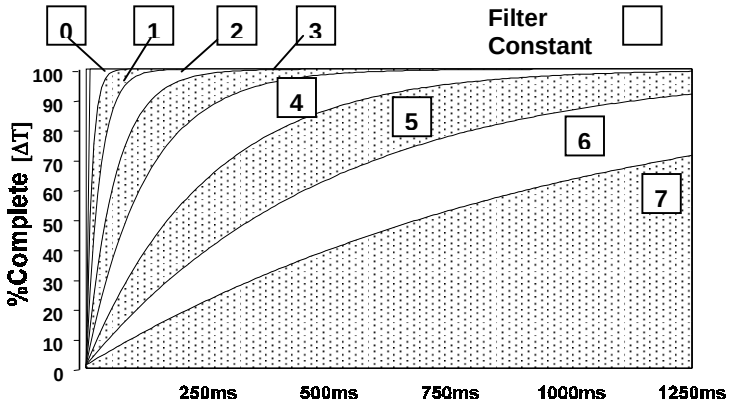
d. Reject Rates sets the frequency level for noise rejection at 50 or 60HZ.

**I/O Map Tab**

The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.



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***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Filter Constant) on module response to a temperature change.

## 4 INPUT AND OUTPUT CONVERSIONS

For a given module configuration, use the appropriate formula in the table to obtain the actual temperature (°C or °F) that is represented by the value in the %AI register.

| Thermocouple Configuration | Temperature Conversion | |
|---|---|---|
| | Celsius | Fahrenheit |
| 0.05° | °C = %AI / 20 * | °F = %AI / 20 * |
| 0.1° | °C = %AI / 10 | °F = %AI / 10 |
| 0.5° | °C = %AI / 2 | °F = %AI / 2 |
| * Maximum reading in 0.05°F or 0.05°C format is limited to 1638.3 because of %AI resolution. | | |

The following table describes how real-world inputs are scaled into the controller. Given a known input voltage, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Voltage In (Vin) / Conversion Factor**

**Example:** The user selects a voltage of 25mV.

1. The known input voltage is 25mV.
2. Using the table, the conversion factor for the voltage range of ± 25mV is .00078125.
3. To determine the data value, the formula is used:
   Data = Vin / Conversion Factor
   32000 = 25mV / .00078125.


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| Conversion of Real-World Inputs to the Controller | | | |
|---|---|---|---|
| | %AI Value | | |
| Selected Voltage Range | Voltage In (Vin) VDC | Data Out | Conversion Factor |
| ± 25mv | -25mv | -32000 | .00078125 |
| | 0 | 0 | |
| | +25mv | +32000 | |
| ± 50mv | -50mv | -32000 | .0015625 |
| | 0 | 0 | |
| | +50mv | +32000 | |
| ± 100mv | -100mv | -32000 | .003125 |
| | 0 | 0 | |
| | +100mv | +32000 | |

## 5 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip
d. In severe applications, shields should be tied directly to the ground block within the panel.
e. Ungrounded thermocouple sensors are preferred due to their isolated electrical characteristics
f. Interposing terminal strips between the sensor and the module can cause errors due to cold junction effect.
g. If Interposing terminal strips must be used, use specially constructed terminal blocks which match the material characteristics of the thermocouple sensor.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 TECHNICAL SUPPORT

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# +/-10V Analog Output Module

**IC300DAC001 / IC300DAC101**
**14-Bit Resolution**

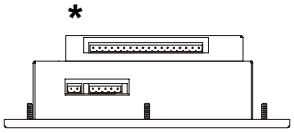
## 1 SPECIFICATIONS

| | DAC001 | DAC101 |
|---|---|---|
| Number of Channels | 2 | 4 |
| Output Range (including over-range) | ± 10.23V | |
| Resolution | 14-Bit | |
| Peak Output Voltage | 10.24V | |
| Load Impedance | 2K Ohms Min. | |
| Load Capacitance | .01µF Max. | |
| PLC Update Rate | Set by PLC Scan Time | |
| Voltage Output Resolution | 14-Bits | |
| Required Power (Steady State) | 0.79W (33mA @ 24VDC) | |
| Required Power (Inrush) | Negligible | |
| Maximum Error | .05% Full Scale | |

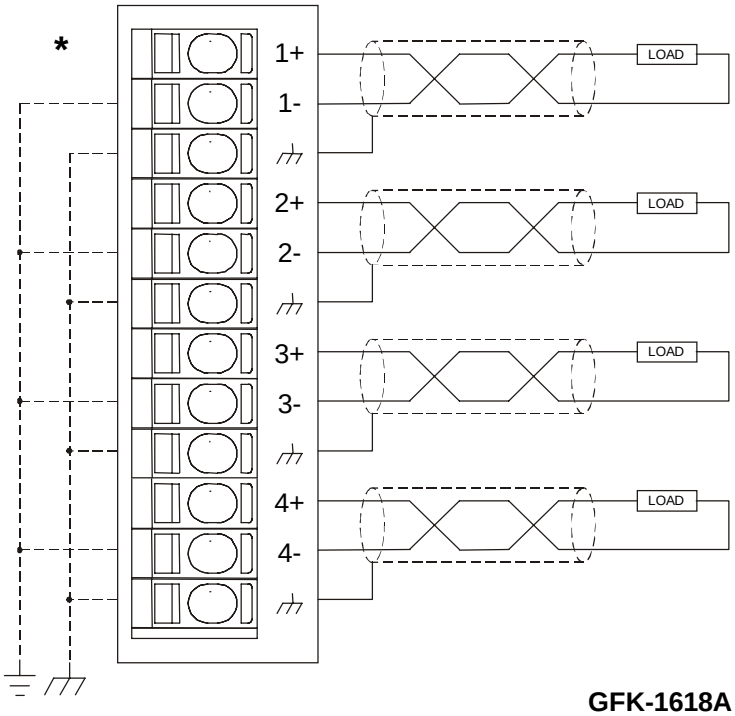
| | DAC001 | DAC101 |
|---|---|---|
| Analog Outputs; Output Points Required | 2 | 4 |
| Accuracy vs. Temperature | .005% / °C | |
| Power Budget Requirement | 150mA Max. | |
| Conversion Settling Time | 1ms. | |
| Operating Temperature | 0° to 60° Celsius | |
| External Power Supply | None | |
| Relative Humidity | 5 to 95% Non-condensing | |
| CE | Refer to GFK-1755 | |
| UL | Refer to GFK-1754 | |
| Terminal Type | Spring Clamp, Removable | |
| Weight | 9.5 oz. (270 g) | |

## 2 WIRING

| Signal | | Pin |
|---|---|---|
| DAC001 | DAC101 | |
| Channel 1+ | Channel 1+ | 1+ |
| Common | Common | 1- |
| Shield | Shield | ⏚ |
| Channel 2+ | Channel 2+ | 2+ |
| Common | Common | 2- |
| Shield | Shield | ⏚ |
| | Channel 3+ | 3+ |
| | Common | 3- |
| | Shield | ⏚ |
| | Channel 4+ | 4+ |
| | Common | 4- |
| | Shield | ⏚ |




**OCS Bottom View – Shows corresponding I/O pin location**




**GFK-1618A**

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# 3 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default values of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

**Module Setup Tab**

a. Output range for each channel may be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.

**Warning:** The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

# 4 OUTPUT CONVERSION FACTOR

The following table describes how program data values are scaled to real-world analog voltage outputs by the module. Given a desired output voltage, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Voltage Out (V out) / Conversion Factor**

**Example:** The user selects ± 10 VDC Output range:

1. The desired voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of 0 - +10 VDC is .0003125.
3. To determine the data value, the formula is used:
   Data = V out / Conversion Factor
   9600 = 3 VDC / .0003125

| Conversion of Real-World Outputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Output Range** | **Data** | **Voltage Out (V out) VDC** | **Conversion Factor** |
| ± 10 VDC Analog Out | + 32736 | +10.23 | .0003125 |
| | + 32000 | +10.00 | |
| | 0 | 0.00 | |
| | - 32000 | -10.00 | |
| | - 32736 | -10.23 | |



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## 5 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 TECHNICAL ASSISTANCE

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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## NOTES


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# 4-20mA Analog Output Module

## IC300DAC002 / IC300DAC102
## 14-Bit Resolution

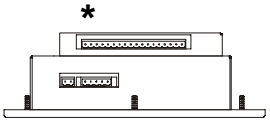
## 1 SPECIFICATIONS

| | DAC002 | DAC102 |
|---|---|---|
| Number of Channels | 2 | 4 |
| Output Ranges (including over-range) | 20.47mA; Clamped @-0.5 - +38VDC Nominal | |
| Resolution | 14-Bits | |
| Peak Output Voltage | 36VDC Max. | |
| PLC Update Rate | Set by PLC Scan Rate | |
| Current Output Resolution | 14-Bits | |
| Required Power (Steady State) | 1.7W (72.6mA @ 24VDC) | |
| Required Power (Inrush) | Negligible | |
| Maximum Error | .05% Full Scale | |
| Maximum Loop Supply | 36VDC | |

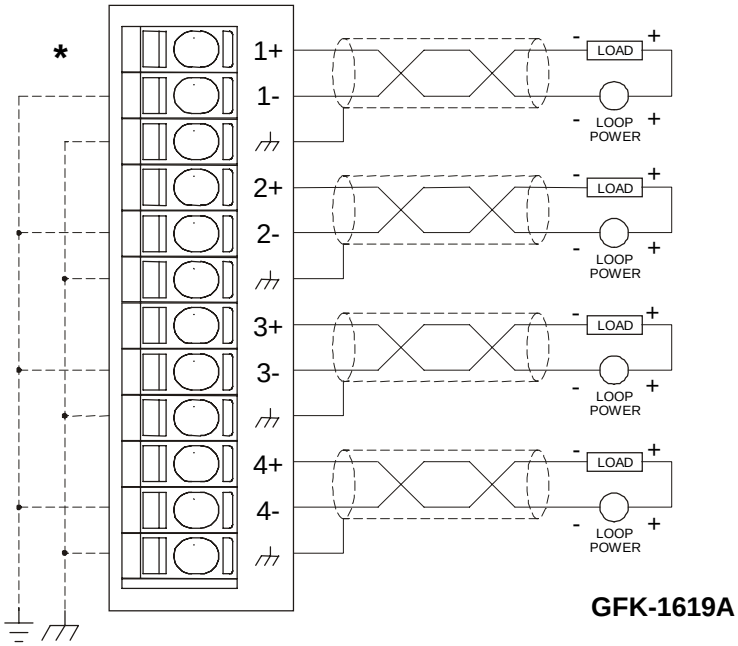
| | DAC002 | DAC102 |
|---|---|---|
| Accuracy vs. Temperature | .005% / °C | |
| Analog Outputs; Output Points Required | 2 | 4 |
| Power Budget Requirement | 60mA Max. from the Bus Controller | |
| Operating Temperature | 0° to 60° Celsius | |
| Maximum Load/Power Supply | 36VDC | |
| External Power Supply | None | |
| UL | Operating Temperature Code T4A; Also refer to GFK-1754 | |
| CE | Refer to GFK-1755 | |
| Terminal Type | Spring Clamp, Removable | |
| Weight | 9.5 oz. (270 g) | |

## 2 WIRING

| Signal | | Pin |
|---|---|---|
| DAC002 | DAC102 | |
| Channel 1+ | Channel 1+ | 1+ |
| Common | Common | 1- |
| Shield | Shield | ⏚ |
| Channel 2+ | Channel 2+ | 2+ |
| Common | Common | 2- |
| Shield | Shield | ⏚ |
| | Channel 3+ | 3+ |
| | Common | 3- |
| | Shield | ⏚ |
| | Channel 4+ | 4+ |
| | Common | 4- |
| | Shield | ⏚ |




**OCS Bottom View – Shows corresponding I/O pin**




**GFK-1619A**

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# 3 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

The **Module Setup** is used in applications where it is necessary to change the default values of the outputs when the controller (e.g., OCS100) enters idle/stop mode. The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

**Module Setup Tab**

a. Output range for each channel may be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.

**Warning:** The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

# 4 OUTPUT CONVERSION FACTOR

The following table describes how program data values are scaled to real-world analog voltage outputs by the module . Given a desired output current, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Output Current (mA) / Conversion Factor**

**Example:** The user selects a current range of +20mA:

1. The desired output current is 12mA.
2. Using the table, the conversion factor for the current range of +20 mA is .000625.
3. To determine the data value, the formula is used:
   Data = Output Current (mA) / Conversion Factor
   19200 = 12mA / .000625

| Conversion of Real-World Outputs into Controller | | | |
|---|---|---|---|
| **Selected Current Range** | **Output Current (mA)** | **Data** | **Conversion Factor** |
| 0 – +20mA | +20.47 | 32752 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |



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## 5 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 TECHNICAL ASSISTANCE

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# +/- 10V Analog Input / Output Module

**IC300MIX011/ IC300MIX111**
**12-Bit Resolution**

## 1 SPECIFICATIONS

| INPUT | MIX011 | MIX111 |
|---|---|---|
| Number of Channels | 1 | 2 |
| Input Ranges (including over-range) | ±10.23VDC; ±5.11, 0- +10.23, 0-5.11 | |
| Resolution | 12-Bit | |
| Input Impedance | 10Meg Ohm <12VDC or 6Meg Ohm >12VDC Nom. | |
| Usable Resolution | 12- Bits | |
| Maximum Error | .1% | |
| Maximum Over-Voltage | 350VDC Max. | |

| | MIX011 | MIX111 |
|---|---|---|
| Analog Inputs Input Points Required | 1 | 2 |
| Power Budget Requirement | Internal 35mA | |
| Digital Filtering | Yes | |
| External Power Supply | None | |
| Converter Type | Successive Approximation | |
| Accuracy vs. Temperature | .01% / °C | |

| OUTPUT | MIX011 | MIX111 |
|---|---|---|
| Number of Channels | 1 | 2 |
| Output Ranges (including over-range) | ± 10.23V | |
| Resolution | 12-Bits | |
| Peak Output Voltage | 10.24V | |
| Load Impedance | 2K Ohms Min. | |
| Load Capacitance | .01µF Max. | |
| PLC Update Rate | Set by PLC Scan Time | |

| | MIX011 | MIX111 |
|---|---|---|
| Analog Outputs; Output Points Required | 1 | 2 |
| Accuracy vs. Temperature | .01% / °C | |
| Power Budget Requirement | 150mA Max. | |
| Conversion Settling Time | 1ms. | |
| External Power Supply | None | |
| Maximum Inaccuracy | .1% | |
| Voltage Output Resolution | 12 Bits | |

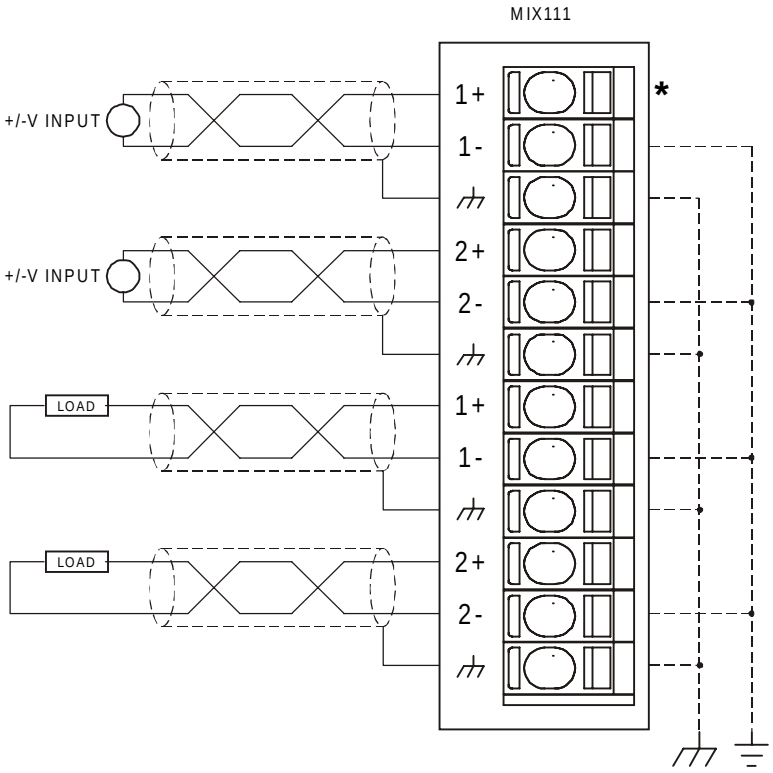
| General Specifications | | | | | |
|---|---|---|---|---|---|
| | MIX011 | MIX111 | | MIX011 | MIX111 |
| Required Power (Steady State) | 1.32W (55mA @ 24VDC) | | CE | Refer to GFK-1755 | |
| Required Power (Inrush) | Negligible | | UL | Refer to GFK-1754 | |
| Relative Humidity | 5 to 95% Non-condensing | | Terminal Type | Spring Clamp, Removable | |
| Operating Temperature | 0° to 60° Celsius | | Weight | 9.5 oz. (270 g) | |

**GFK-1620A**

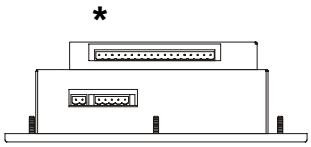
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## 2 WIRING

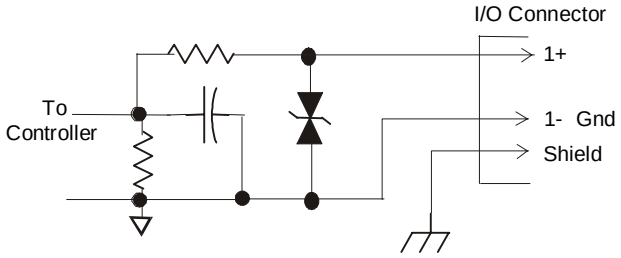


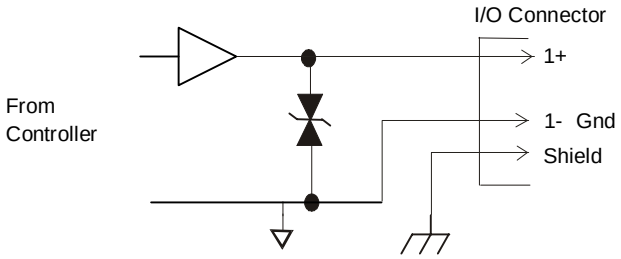

| Pin | Signal | |
|---|---|---|
| | MIX011 | MIX111 |
| I1+ | Channel 1+ | Channel 1+ |
| I1- | Common | Common |
| ⏚ | Shield | Shield |
| I2+ | | Channel 2+ |
| I2- | | Common |
| ⏚ | | Shield |
| Q1+ | Channel 1+ | Channel 1+ |
| Q1- | Common | Common |
| ⏚ | Shield | Shield |
| Q2+ | | Channel 2+ |
| Q2- | | Common |
| ⏚ | | Shield |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATIC






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# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

**I/O Map Tab**

The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

**Module Setup Tab**

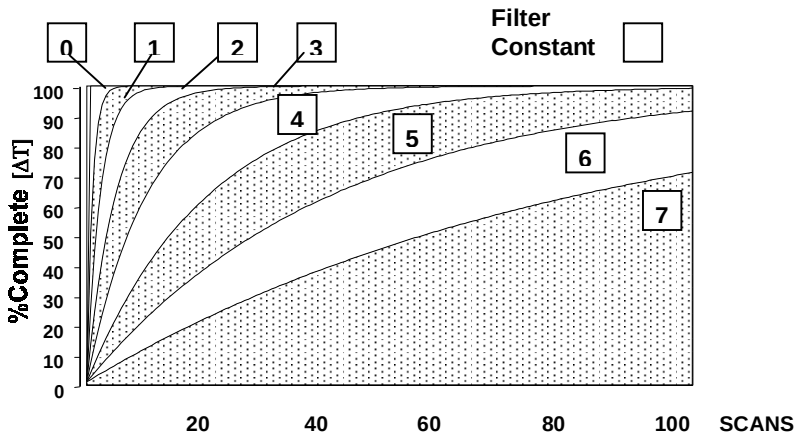
The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

**1. For Analog Outputs:** The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

> **Warning:** The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

**2. Analog Inputs**

a. Input range for each channel can be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.




***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Fillter Constant) on module response to a temperature change.



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# 5 INPUT and OUTPUT CONVERSIONS

## 5.1 Input Conversion Factor

The following table describes how real-world inputs are scaled into the controller. Given a known input voltage, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Voltage In (Vin) / Conversion Factor**

**Example:** The user selects a voltage range of 0 - +5 VDC:

1. The known input voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of 0 - +5 VDC is .00015625.
3. To determine the data value, the formula is used:
   Data = Vin / Conversion Factor
   19200 = 3 VDC / .00015625

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Range** | **Voltage In (Vin) VDC** | **Data Out** | **Conversion Factor** |
| 0 - +5.00 VDC | +5.11 | 32704 | .00015625 |
| | +5.00 | 32000 | |
| | 0.00 | 0 | |
| | NA | NA | |
| | NA | NA | |
| 0 - +10.00 VDC | +10.23 | 32736 | .0003125 |
| | +10.00 | 32000 | |
| | 0.00 | 0 | |
| | NA | NA | |
| | NA | NA | |
| +/-5.00 VDC | +5.11 | 32704 | .00015625 |
| | +5.00 | 32000 | |
| | 0 | 0 | |
| | -5.00 | -32000 | |
| | -5.11 | -32704 | |
| +/-10.00 VDC | +10.23 | 32736 | .0003125 |
| | +10.00 | 32000 | |
| | 0 | 0 | |
| | -10.00 | -32000 | |
| | -10.23 | -32736 | |



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### 5.2 Output Conversion Factor

The following table describes how program data values are scaled to real-world analog voltage outputs by the module. Given a desired output voltage, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Voltage Out (V out) / Conversion Factor**

**Example:** The user selects ± 10 VDC output range:

1. The desired voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of 0 - +10 VDC is .0003125.
3. To determine the data value, the formula is used:
   Data = V out / Conversion Factor
   9600 = 3 VDC / .0003125

| Conversion of Real-World Outputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Output Range** | **Data** | **Voltage Out (V out) VDC** | **Conversion Factor** |
| ± 10 VDC Analog Out | + 32736 | +10.23 | .0003125 |
| | + 32000 | +10.00 | |
| | 0 | 0.00 | |
| | - 32000 | -10.00 | |
| | - 32736 | -10.23 | |

## 6 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 7 TECHNICAL ASSISTANCE

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# 4-20mA Analog Input / Output Module

**IC300MIX022 / IC300MIX122**
**12-Bit Resolution**

## 1 SPECIFICATIONS

| INPUT | MIX022 | MIX122 |
|---|---|---|
| Number of Channels | 1 | 2 |
| Input Ranges (including over-range) | Nominal: 0-20.47mA, Optional: ±2047mA. | |
| Resolution | 12-Bit | |
| Input Impedance | 100 Ohm < 12VDC, Clamped @ 12VDC, 35mA Max. Continuous | |
| Maximum Error | .1% | |
| Maximum Over-Current | 35mA | |
| Input Current | 0-20mA (.48mA) | |

| | MIX022 | MIX122 |
|---|---|---|
| Analog Inputs Input Points Required | 1 | 2 |
| Conversion Time (PLC Update Rate) | Set by PLC Scan Time | |
| Converter Type | Successive Approximation | |
| Accuracy vs. Temperature | .01% / °C | |
| External Power Supply | None | |

| OUTPUT | MIX022 | MIX122 |
|---|---|---|
| Number of Channels | 1 | 2 |
| Output Ranges (including over-range) | 20.47mA; Clamped @-0.5 - +38VDC Nominal | |
| Resolution | 12 Bits | |
| Peak Output Voltage | 36VDC Max. | |
| Current Output Resolution | 12 Bits | |

| | MIX022 | MIX122 |
|---|---|---|
| Analog Outputs; Output Points Required | 1 | 2 |
| Accuracy vs. Temperature | .01% / °C | |
| External Power Supply | None | |
| Maximum Inaccuracy | .1% | |
| Loop Voltage | 1.5 – 36VDC | |

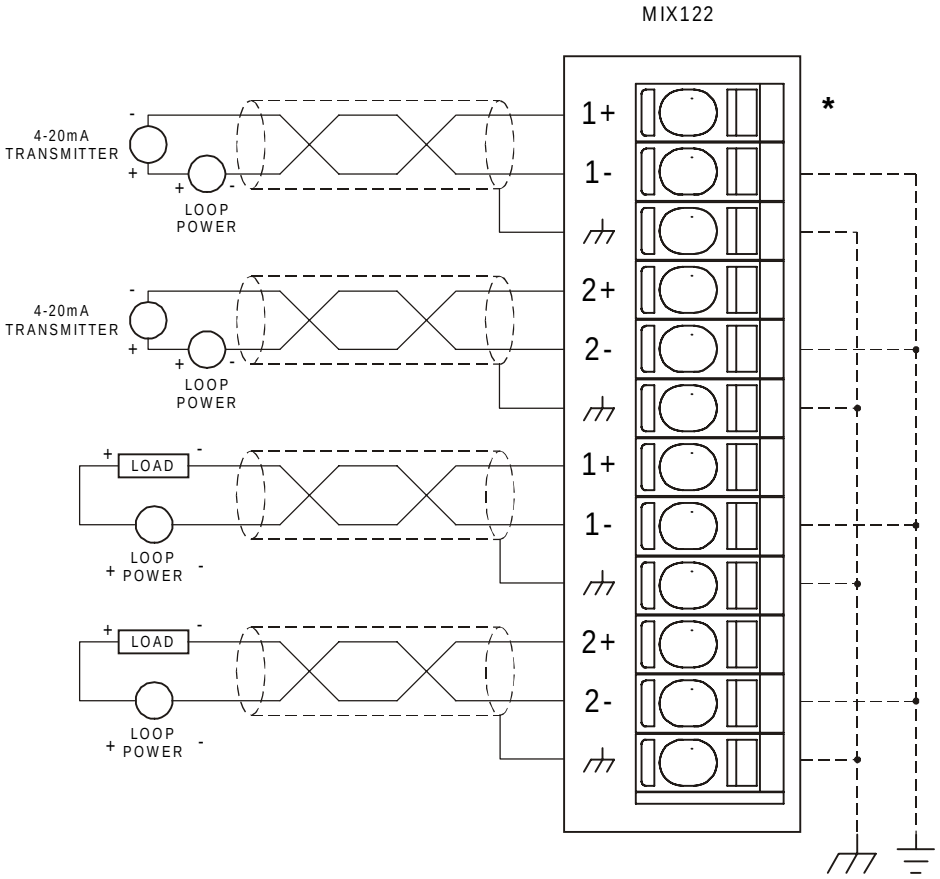
| General Specifications | | | | | |
|---|---|---|---|---|---|
| | MIX022 | MIX122 | | MIX022 | MIX122 |
| Required Power (Steady State) | 1.32W (55mA @ 24VDC) | | CE | Refer to GFK-1755 | |
| Required Power (Inrush) | Negligible | | UL | Refer to GFK-1754 | |
| Relative Humidity | 5 to 95% Non-condensing | | Terminal Type | Spring Clamp, Removable | |
| Operating Temperature | 0° to 60° Celsius | | Weight | 9.5 oz. (270 g) | |



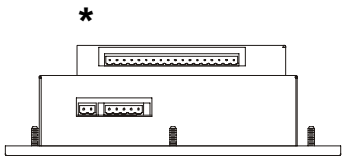
This Data Sheet (GFK-1621A) is published individually & also as a part of the SmartStack Supplement (GFK-1601A).
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## 2 WIRING




| Pin | Signal | |
|---|---|---|
| | MIX022 | MIX122 |
| I1+ | Channel 1+ In | Channel 1+ In |
| I1- | Common | Common |
| ⏚ | Shield | Shield |
| I2+ | | Channel 2+ In |
| I2- | | Common |
| ⏚ | | Shield |
| Q1+ | Channel 1+ Out | Channel 1+ Out |
| Q1- | Common | Common |
| ⏚ | Shield | Shield |
| Q2+ | | Channel 2+ Out |
| Q2- | | Common |
| ⏚ | | Shield |

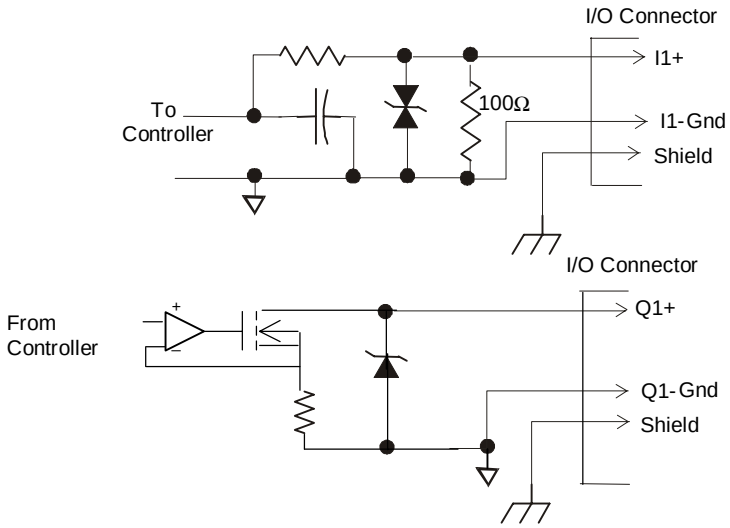



**OCS Bottom View – Shows corresponding I/O pin location**



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# 3 INTERNAL CIRCUIT SCHEMATIC




# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

**I/O Map Tab**

The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

**Module Setup Tab**

The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

**1. For Analog Outputs:** The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

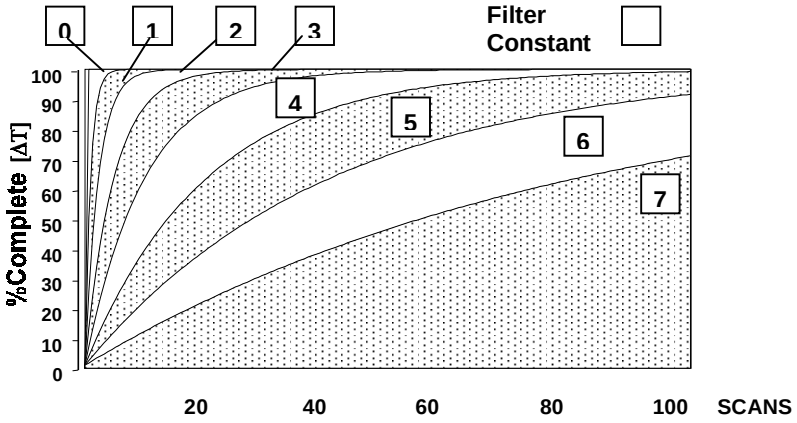
> **Warning:** The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

**2. Analog Inputs:**

a. Input and output range for each channel can be selected independently.
b. Filter Constant sets the level of digital filtering according to the following chart.


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***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Filter Constant) on module response to a temperature change.

# 5 INPUT and OUTPUT CONVERSION FACTORS

## 5.1 Input Conversion Factor

The following table describes how real-world inputs are scaled into the controller. Given a known input current, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Input Current (mA) / Conversion Factor**

**Example:** The user selects a current range of 0 - +20mA:

1. The known input current is 14mA.
2. Using the table, the conversion factor for the current range of 0 - +20mA is .000625.
3. To determine the data value, the formula is used:
   Data = Input Current (mA) / Conversion Factor
   22400 = 14mA / .000625

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Current Range** | **Input Current (mA)** | **Data** | **Conversion Factor** |
| 0 – +20mA | +20.47 | 32752 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |
| -20 to +20mA | -20.00 | -32000 | .000625 |
| | -20.47 | -32752 | |


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### 5.2 Output Conversion Factor

The following table describes how program data values are scaled to real-world analog voltage outputs by the module . Given a desired output current, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Output Current (mA) / Conversion Factor**

**Example:** The user selects a current range of +20mA:

1. The desired output current is 12mA.
2. Using the table, the conversion factor for the current range of +20 mA is .000625.
3. To determine the data value, the formula is used:
   Data = Output Current (mA) / Conversion Factor
   19200 = 12mA / .000625

| Conversion of Real-World Outputs into Controller | | | |
|---|---|---|---|
| **Selected Current Range** | **Output Current (mA)** | **Data** | **Conversion Factor** |
| 0 – +20mA | +20.47 | 32752 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |

## 6 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 7 TECHNICAL ASSISTANCE

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# 24VDC Bipolar Digital In
# 10-28VDC, 0.5A Sourcing Digital Out
# IC300MIX901
# +/- 10V Analog In/Out

## 1 SPECIFICATIONS

| ANALOG INPUT | MIX901 | | MIX901 |
|---|---|---|---|
| Number of Channels | 4 | Analog Inputs Input Points Required | 4 |
| Input Ranges (including over-range) | ±10.23VDC | Usable Resolution | 12- Bits |
| Resolution | 12-Bit | Digital Filtering | Yes |
| Input Impedance | 1Meg Ohm <12VDC or clamped @ 12VDC Nom. | Accuracy vs. Temperature | .01% / °C |
| Maximum Clamp Current | 75mA. | Maximum Error | .1% |
| **DIGITAL INPUT** | **MIX901** | | **MIX901** |
| Inputs per Module | 8 | Input Characteristics | Bidirectional |
| Commons per Module | 1 | Input Impedance | 10K Ohms |
| Input Voltage Range | 12-24VDC | Minimum ON Current | 1mA |
| Peak Voltage | 35VDC Max. | Maximum OFF Current | 200µA |
| Isolation (Channel to Bus) | 500VDC | OFF to ON Response | 1ms. |
| ON Voltage Level | 9VDC | ON to OFF Response | 1ms. |
| OFF Voltage Level | 3VDC | | |
| **ANALOG OUTPUT** | **MIX901** | | **MIX901** |
| Number of Channels | 2 | Analog Outputs; Output Points Required | 2 |
| Output Ranges (including over-range) | ± 10.23V | Accuracy vs. Temperature | .01% / °C |
| Resolution | 12-Bits | PLC Update Rate | Set by PLC Scan Time |
| Peak Output Voltage | 10.23V | Conversion Settling Time | 1ms. |
| Load Impedance | 2K Ohms Min. | Voltage Output Resolution | 12 Bits |
| Load Capacitance | .01µF MAX | Maximum Inaccuracy | .1% |
| **DIGITAL OUTPUT** | **MIX901** | | **MIX901** |
| Outputs per Module | 8 | Maximum Inrush Current | 650mA |
| Commons per Module | 1 | Minimum Load | None |
| Operating Voltage | 10 - 28VDC | OFF to ON Response | 1ms. |
| Output Type | Sourcing / 10K Pull-Down | ON to OFF Response | 1ms. |
| Peak Voltage | 28VDC Max. | Output Characteristics | Current Sourcing |
| Maximum Load Current | 0.5A Max. | Output Protection | Short Circuit |

**GFK-1664A**

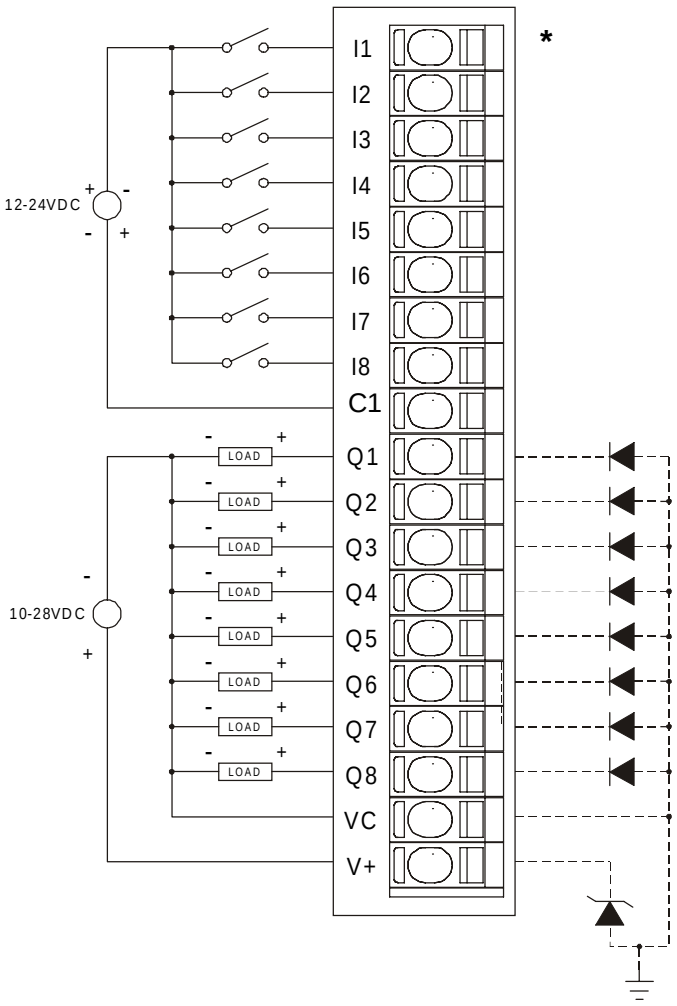

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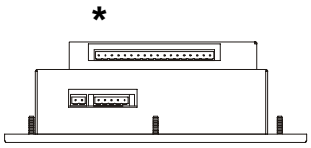
| General Specifications | | | |
|---|---|---|---|
| | **MIX901** | | **MIX901** |
| Required Power (Steady State) | 0.33W (13.75mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Operating Temperature Code T4A; Also refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (270 g) |

# 2 WIRING

## 2.1 Digital Input / Output (P1)




| Pin | Digital Input /Output MIX901 - P1 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C1 | Common (Isolated) |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| Q5 | Output 5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| VC | Load Power Common |
| V+ | Load Voltage + |

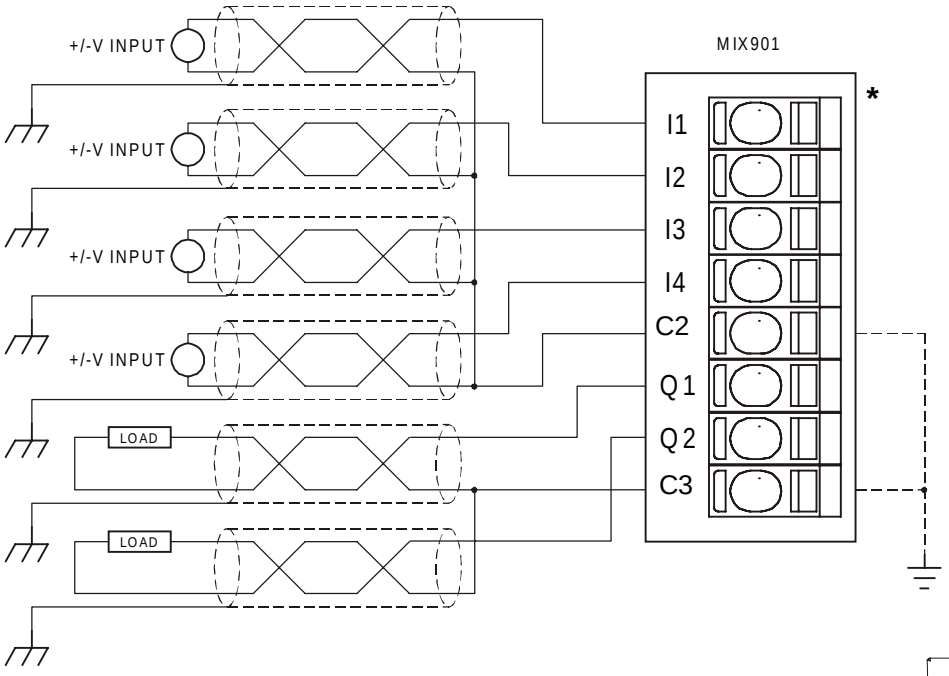



**OCS Bottom View – Shows corresponding I/O pin location**

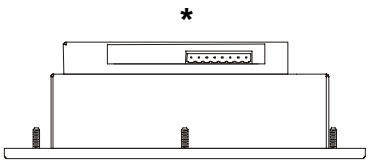


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## 2.2 Analog Input / Output (P2)

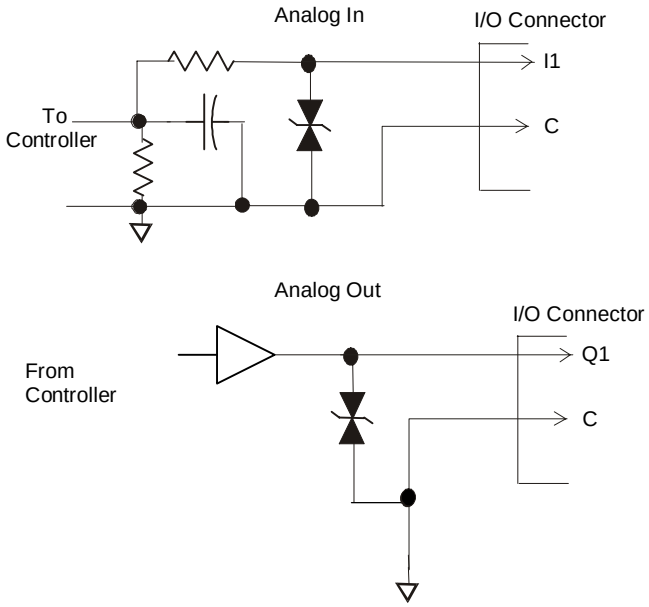



| Pin | Analog In and Out MIX901 P2 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| C2 | Input Common |
| Q1 | Output 1 |
| Q2 | Output 2 |
| C3 | Output Common |



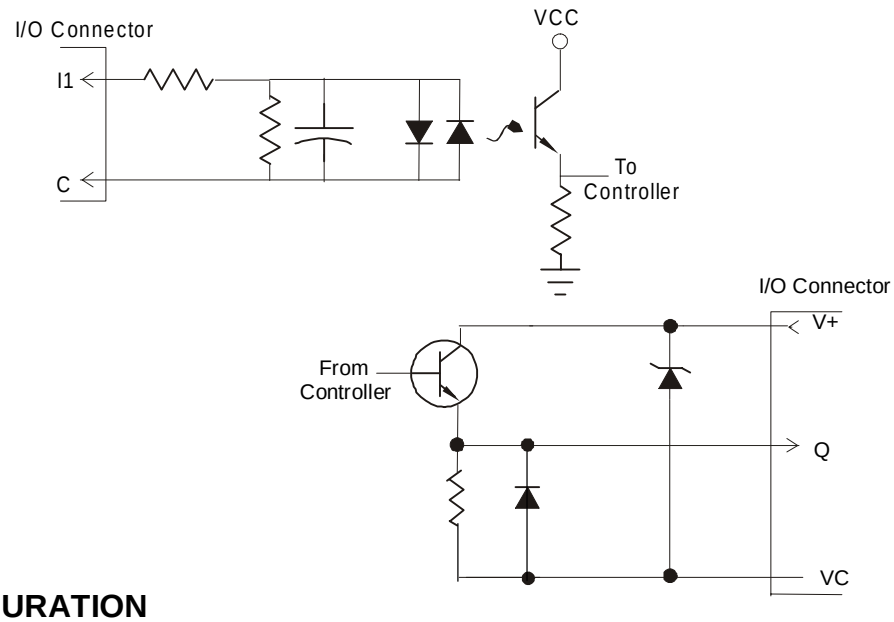

**OCS Top View – Shows corresponding I/O pin location**

## INTERNAL CIRCUIT SCHEMATIC






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## CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

**Module Setup Tab**

The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

**1. For Digital Outputs:** The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

> **Warning:** The default turns the digital outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default settings.

**2. For Analog Outputs:** The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

> **Warning:** The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

**3. For Analog Inputs:**

a. Input range for each channel can be selected independently.

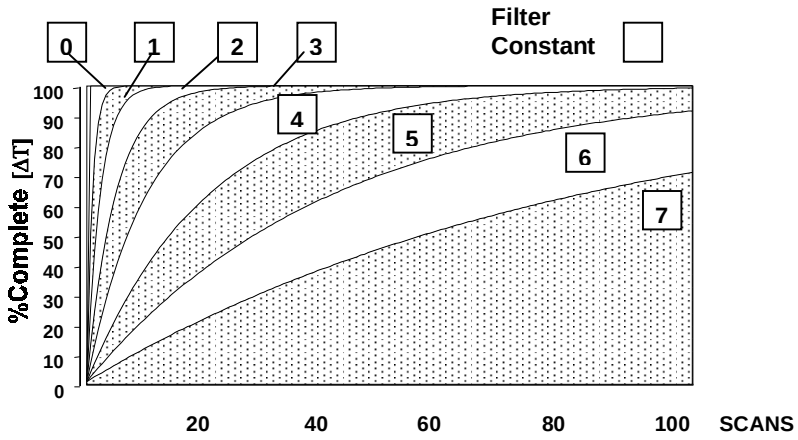
b. Filter Constant sets the level of digital filtering according to the following chart.

**I/O Map Tab**

The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.


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***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Fillter Constant) on module response to a temperature change.

# 5 ANALOG INPUT and OUTPUT CONVERSIONS

## 5.1 Input Conversion Factor

The following table describes how real-world inputs are scaled into the controller. Given a known input voltage, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Voltage In (Vin) / Conversion Factor**

**Example:** The voltage range is +/-10VDC:

1. The known input voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of +/-10VDC is .0003125.
3. To determine the data value, the formula is used:
   Data = Vin / Conversion Factor
   9600 = 3 VDC / .0003125

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Range** | **Voltage In (Vin) VDC** | **Data Out** | **Conversion Factor** |
| +/-10.00 VDC | +10.23 | 32736 | .0003125 |
| | +10.00 | 32000 | |
| | 0 | 0 | |
| | -10.00 | -32000 | |
| | -10.23 | -32736 | |



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### 5.2 Output Conversion Factor

The following table describes how program data values are scaled to real-world analog voltage outputs by the module. Given a desired output voltage, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Voltage Out (V out) / Conversion Factor**

**Example:** The user selects ± 10 VDC output range:

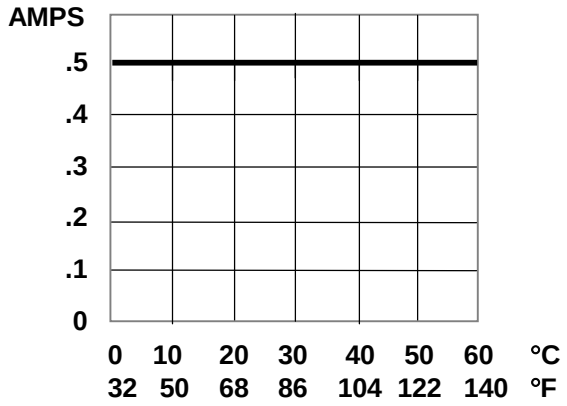
1. The desired voltage is 3 VDC.
2. Using the table, the conversion factor for the voltage range of +/-10 VDC is .0003125
3. To determine the data value, the formula is used:
   Data = V out / Conversion Factor
   9600 = 3 VDC / .0003125

| Conversion of Real-World Outputs into Controller | | | |
|---|---|---|---|
| **Selected Voltage Output Range** | **Data** | **Voltage Out (V out) VDC** | **Conversion Factor** |
| ± 10 VDC Analog Out | + 32736 | +10.23 | .0003125 |
| | + 32000 | +10.00 | |
| | 0 | 0.00 | |
| | - 32000 | -10.00 | |
| | - 32736 | -10.23 | |

## DIGITAL OUTPUT CHARACTERISTICS

### Derating Chart for MIX901

.






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## 6 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 7 TECHNICAL ASSISTANCE

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# 24VDC Bipolar Digital In
# 10-28VDC, 0.5A Sourcing Digital Out
# IC300MIX902
# 4-20mA Analog In/Out

## 1 SPECIFICATIONS

| ANALOG INPUT | MIX902 | | MIX902 |
|---|---|---|---|
| Number of Channels | 4 | Analog Inputs Input Points Required | 4 |
| Input Ranges (including over-range) | Nominal: 0-20.47mA | Conversion Time (PLC Update Rate) | Set by PLC Scan Time |
| Resolution | 12-Bit | Converter Type | Successive Approximation |
| Input Impedance | 200 Ohms < 12VDC, Clamped @ 12VDC, 35mA Max. Continuous | Accuracy vs. Temperature | .01% / °C |
| Maximum Error | .1% | Maximum Over-Current | 35mA |
| **DIGITAL INPUT** | **MIX902** | | **MIX902** |
| Inputs per Module | 8 | Input Characteristics | Bidirectional |
| Commons per Module | 1 | Input Impedance | 10K Ohms |
| Input Voltage Range | 12-24VDC | Minimum ON Current | 1mA |
| Peak Voltage | 35VDC Max. | Maximum OFF Current | 200µA |
| Isolation (Channel to Bus) | 500VDC | OFF to ON Response | 1ms. |
| ON Voltage Level | 9VDC | ON to OFF Response | 1ms. |
| OFF Voltage Level | 3VDC | | |
| **ANALOG OUTPUT** | **MIX902** | | **MIX902** |
| Number of Channels | 2 | Analog Outputs; Output Points Required | 2 |
| Output Ranges (including over-range) | 20.47mA; Clamped @-0.5 - +33VDC Nominal | Accuracy vs. Temperature | .01% / °C |
| Resolution | 12 Bits | Maximum Inaccuracy: | .1% (Note: Used 2% error under EMC testing.) |
| Output Voltage | 4 - 30VDC | | |
| **DIGITAL OUTPUT** | **MIX902** | | **MIX902** |
| Outputs per Module | 8 | Maximum Inrush Current | 650mA |
| Commons per Module | 1 | Minimum Load | None |
| Operating Voltage | 10 - 28VDC | OFF to ON Response | 1ms. |
| Output Type | Sourcing / 10K Pull-Down | ON to OFF Response | 1ms. |
| Peak Voltage | 28VDC Max. | Output Characteristics | Current Sourcing |
| Maximum Load Current | 0.5A Max. | Output Protection | Short Circuit |

**GFK-1665A**


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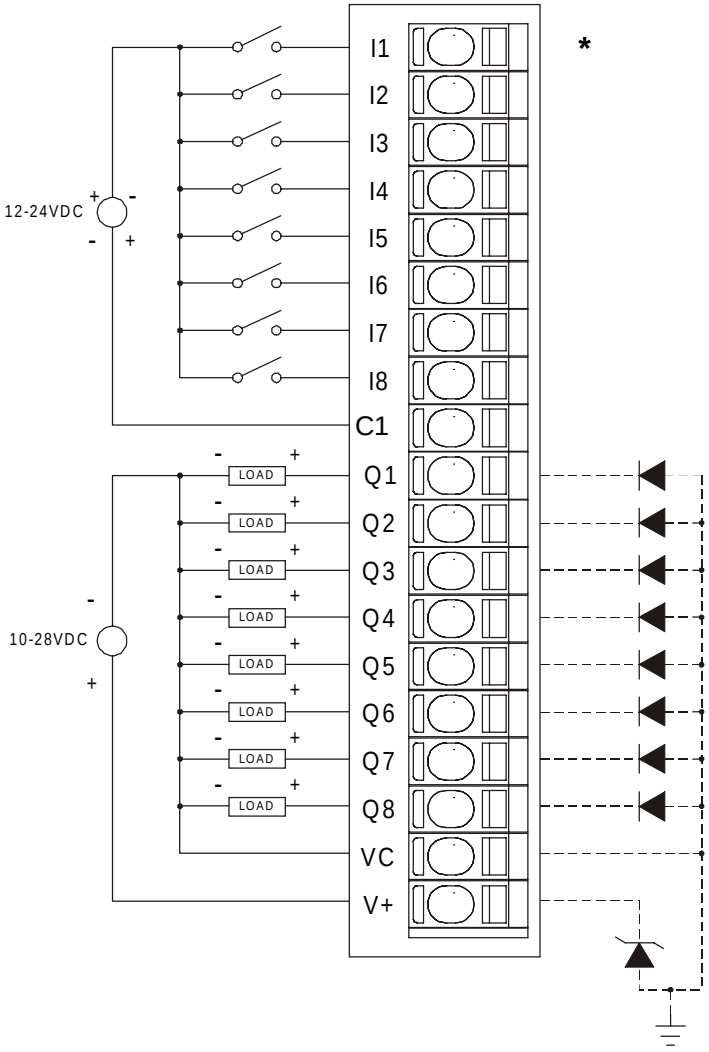
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TBA = To Be Announced

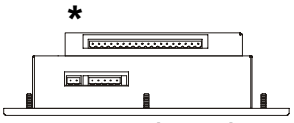
| General Specifications | | | |
|---|---|---|---|
| | **MIX902** | | **MIX902** |
| Required Power (Steady State) | 0.03W (1.65MA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | Negligible | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (270 g) |

# 2 WIRING

## 2.1 Digital Input / Output (P1)




| Pin | Digital Input / Output MIX902 - P1 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C1 | Common (Isolated) |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| Q5 | Output 5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| VC | Load Power Common |
| V+ | Load Voltage + |

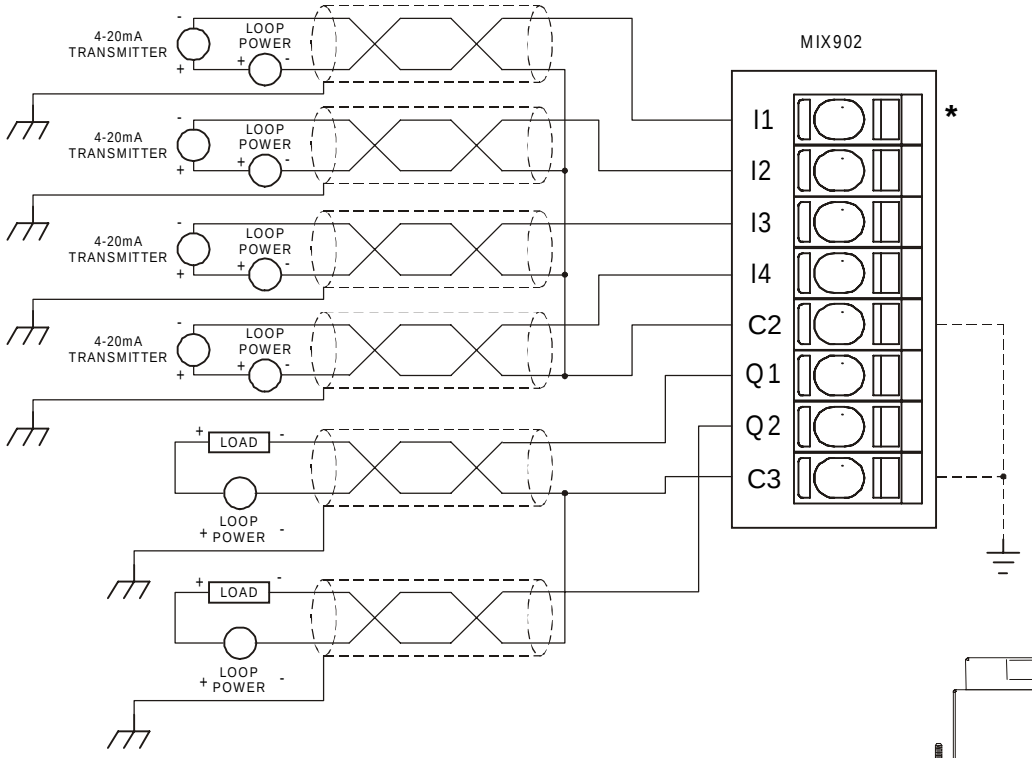



**OCS Bottom View – Shows corresponding I/O pin location**

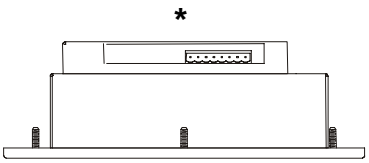

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## 2.2 Analog Input / Output (P2)

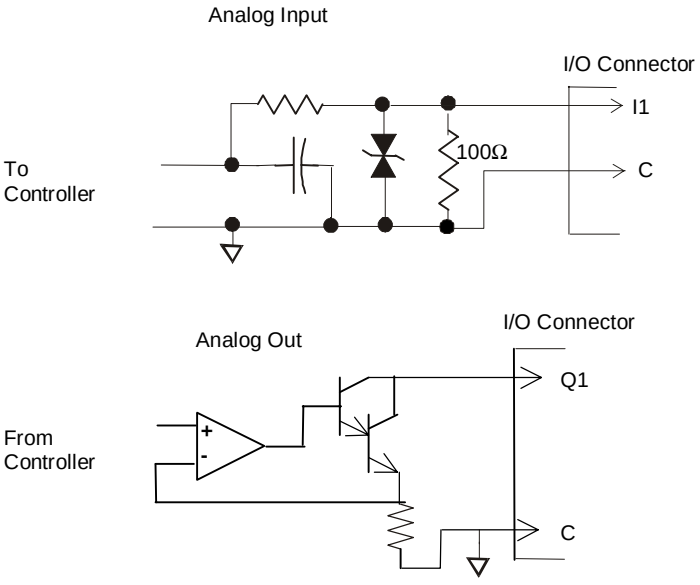



| Pin | Analog In and Out MIX902 P2 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| C2 | Input Common |
| Q1 | Output 1 |
| Q2 | Output 2 |
| C3 | Output Common |



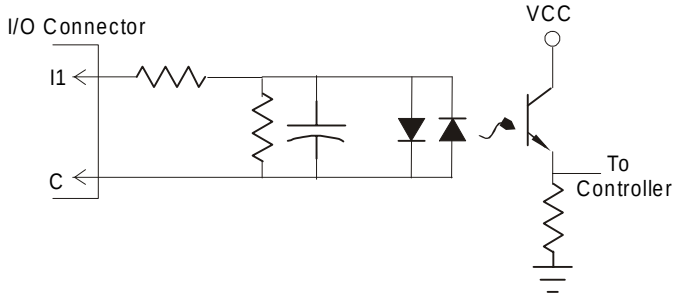

**OCS Top View – Shows corresponding I/O pin location**

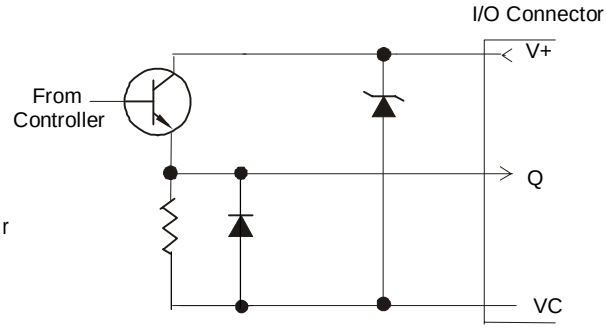
# 3 INTERNAL CIRCUIT SCHEMATIC






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# 4 CONFIGURATION

Preliminary configuration procedures that are applicable to all SmartStack™ Modules are located in the Control Station Hardware Manual (GFK-1631).

**Module Setup Tab**

The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

**1. For Digital Outputs:** The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

> **Warning:** The default turns the digital outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default settings.

**2. For Analog Outputs:** The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

> **Warning:** The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

**3. For Analog Inputs:**

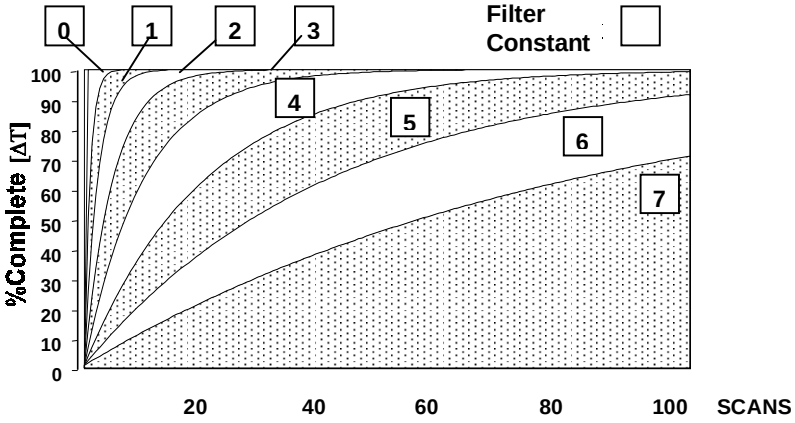
Filter Constant sets the level of digital filtering according to the following chart.

**I/O Map Tab**

The I/O Map describes which I/O registers are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.



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***Digital Filtering***. The illustration above demonstrates the effect of digital filtering (set with Fillter Constant) on module response to a temperature change.

# 5 ANALOG INPUT and OUTPUT CONVERSION FACTORS

## 5.1 Input Conversion Factor

The following table describes how real-world inputs are scaled into the controller. Given a known input current, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Input Current (mA) / Conversion Factor**

**Example:** The user selects a current range of 0 - +20mA:

1. The known input current is 14mA.
2. Using the table, the conversion factor for the current range of 0 - +20mA is .000625.
3. To determine the data value, the formula is used:
   Data = Input Current (mA) / Conversion Factor
   22400 = 14mA / .000625

| Conversion of Real-World Inputs into Controller | | | |
|---|---|---|---|
| **Selected Current Range** | **Input Current (mA)** | **Data** | **Conversion Factor** |
| 0 – +20mA | +20.47 | 32752 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |

## 5.2 Output Conversion Factor

The following table describes how program data values are scaled to real-world analog voltage outputs by the module . Given a desired output current, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Output Current (mA) / Conversion Factor**


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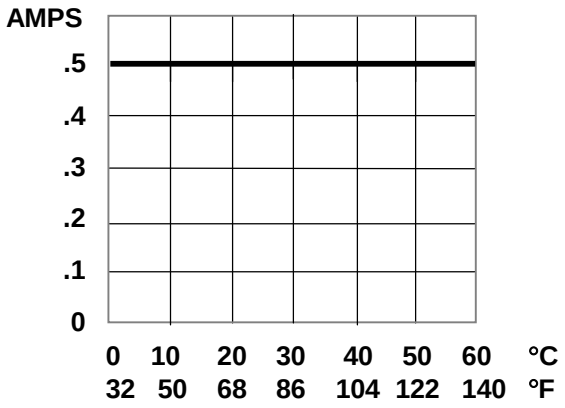
**Example:** The user selects a current range of +20mA:

1. The desired output current is 12mA.
2. Using the table, the conversion factor for the current range of +20 mA is .000625.
3. To determine the data value, the formula is used:
   Data = Output Current (mA) / Conversion Factor
   19200 = 12mA / .000625

| Conversion of Real-World Outputs into Controller | | | |
|---|---|---|---|
| **Selected Current Range** | **Output Current (mA)** | **Data** | **Conversion Factor** |
| 0 – +20mA | +20.47 | 32752 | .000625 |
| | +20.00 | 32000 | |
| | 0 | 0 | |

## 6 DIGITAL OUTPUT CHARACTERISTICS

### Derating Chart for MIX902




## 7 INSTALLATION / SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 8 TECHNICAL ASSISTANCE

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# ASCII Basic Module

## IC300ASC100

## 3 High Speed Communication Ports

This product also has a detailed supplement **(GFK-1666)** available.

## 1 SPECIFICATIONS

| | ASC100 | | | ASC100 |
|---|---|---|---|---|
| Number of communication ports | 3<br>(2 RS232, 1 RS485/422 | | User Memory for BASIC ***program*** storage | 32K bytes |
| Status LEDs | RXD/TXD for all ports<br>RUN (BASIC program) | | User Memory for BASIC ***data*** storage | 32K bytes |

| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.22W (9.35mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | 0.53W (22.4mA @ 24VDC) | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | 9-Pin D-Subs |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (270 g) |



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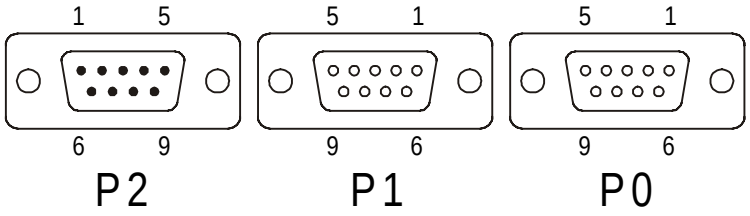
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## 2 WIRING

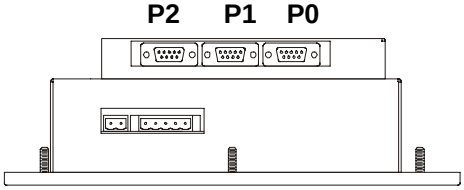
**Note:** Port 1 and Port 2 share internal communication circuitry. Only one of the ports can be used to transfer data at a time.

| Direction | Pin | ASC100 Port 0/1 |
|---|---|---|
| Output | 1 | **DCD** (Data Carrier Detect) |
| Output | 2 | **RXD** (Receive Data) |
| Input | 3 | **TXD** (Transmit Data) |
| Input | 4 | **DTR** (Data Terminal Ready) |
| GND | 5 | **Signal Ground** |
| Output | 6 | **DSR** (Data Set Ready) |
| Input | 7 | **CTS** (Clear to Send) |
| Output | 8 | **RTS** (Request to Send) |
| Output | 9 | **RI** (Ring Indicate) |

**Note:** For ports 0 and 1, the signal names reflect the EIA RS232 signal names for a DCE device. The names do not necessarily reflect the signal direction with respect to the ASC100 module.




| Direction | Pin | ASC100 Port 2 |
|---|---|---|
| Input | 1 | **RXD-** (Receive Data -) |
| Output | 2 | **TXD-** (Transmit Data -) |
| Output | 3 | **CTS-** (Clear to Send -) |
| Input | 4 | **RTS-** (Request to Send -) |
| GND | 5 | **GND** (Signal Ground) |
| Input | 6 | **RXD+** (Receive Data +) |
| Output | 7 | **TXD+** (Transmit Data +) |
| Output | 8 | **CTS+** (Clear to Send +) |
| Input | 9 | **RTS+** (Request to Send +) |




**OCS Bottom View – Shows corresponding I/O pin location**



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## 3 CONFIGURATION

See the Supplement for the SmartStack ASCII BASIC Module (GFK-1666**)** for configuration, wiring, and other pertinent data.

## 4 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 5 TECHNICAL ASSISTANCE

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# High Speed Counter

## IC300HSC600
## High Speed Counter Inputs
## Sinking Pulse Outputs

This product also has a detailed supplement (GFK-1643) available.

## 1 SPECIFICATIONS

| INPUT | HSC600 | | | | | HSC600 |
|---|---|---|---|---|---|---|
| Inputs per Module | 8 | | | | Commons per Module | 1 |
| Programmable Input Voltage Ranges | Zero Crossing | TTL / 5 VDC | 12 VDC | 24 VDC | Input Type | Positive Logic |
| | | | | | Peak Voltage | 35VDC Max. |
| ON Voltage Level | + 0.1 | + 2 | + 8 | + 16 | Input Impedance | 10K Ohms |
| OFF Voltage Level | - 0.1 | + 0.8 | + 4 | + 8 | Input Filter | 500KHz, 50KHz, 5KHz |

| OUTPUT | HSC600 | | HSC600 |
|---|---|---|---|
| Outputs per Module | 8 | Output Protection | Short Circuit |
| Commons per Module | 1 | Maximum Leakage Current | 100µA |
| Operating Voltage | 5 - 35VDC | Maximum Inrush Current | 600mA. |
| Output Type | Sinking / 10K Pull-Up Negative Logic | Minimum Load | None |
| Peak Voltage | 35VDC Max. | OFF to ON Response | 0.3µS. |
| Output Characteristics | Current Sinking | ON to OFF Response | 2µS. |
| ON Voltage Level | 1.5VDC Max. @ 500mA<br>0.7 VDC Max. @ 250mA | Maximum Load Current | 0.5A |

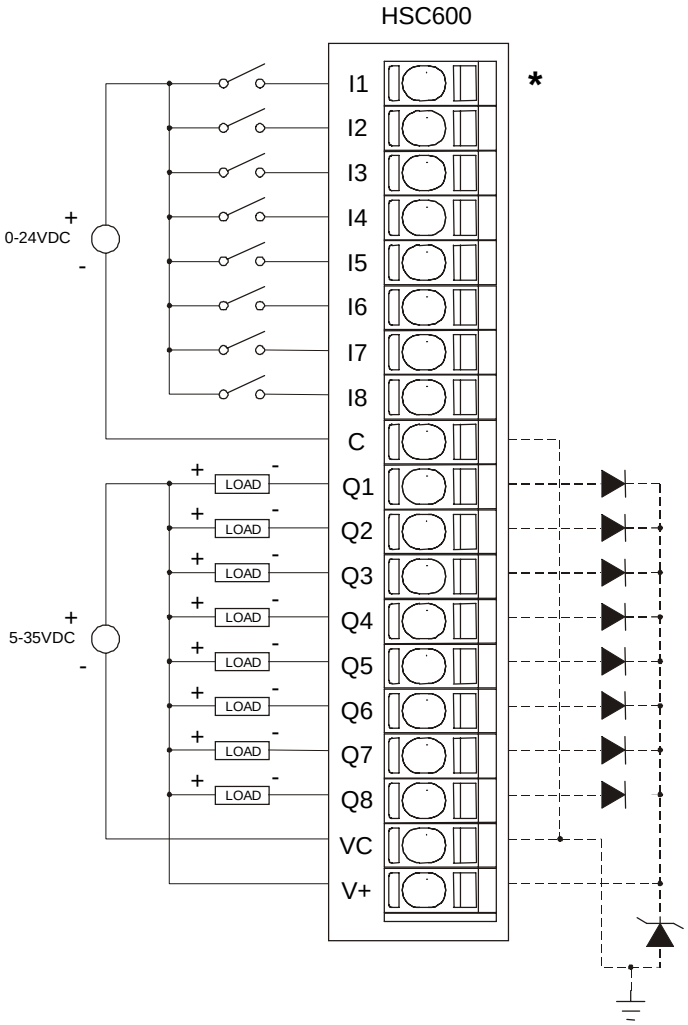
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.29W (12.43mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | 0.44W (18.4mA @ 24VDC) | UL | Operating Temperature Code T4A; Also refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (270 g) |

**GFK-1622A**

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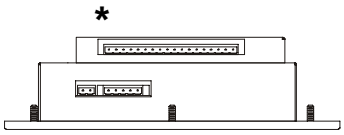
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## 2 WIRING



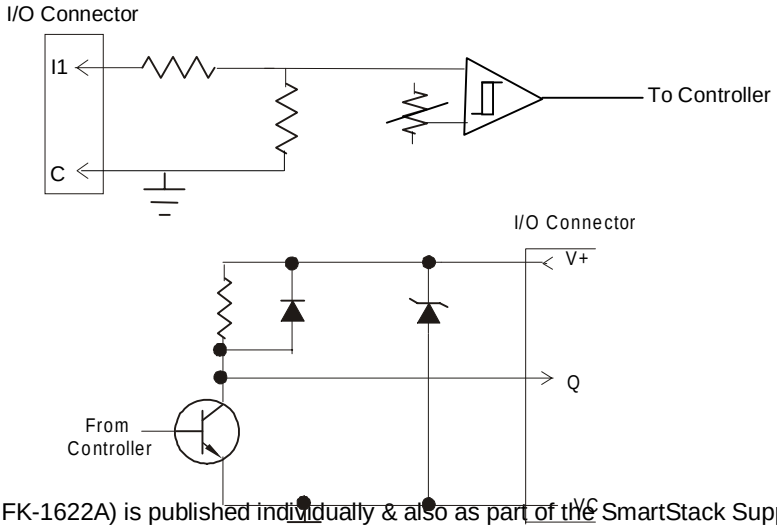

| Pin | Signal HSC600 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C | Common[1] |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| Q5 | Output 5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| VC | Common[1] |
| V+ | Load Voltage + |

[1] Internally Connected




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATIC





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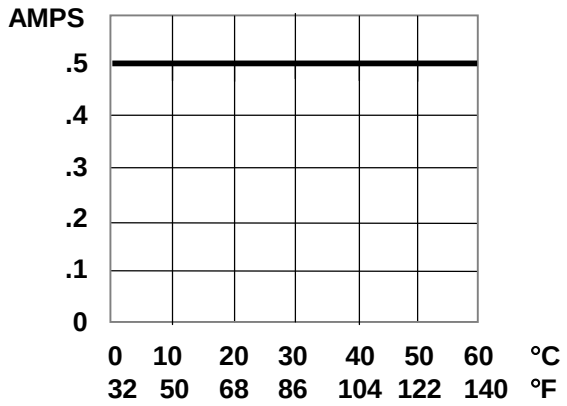
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# 4 CONFIGURATION AND MODES

See the Supplement for the High Speed Counter Supplement (GFK-1643) for detailed information covering configuration and input/output modes.

# 5 OUTPUT CHARACTERISTICS

**Derating Chart for IC300HSC600**




# 6 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

# 7 TECHNICAL ASSISTANCE

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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# High Speed Counter

**IC300HSC601**
**High Speed Counter Inputs**
**Sourcing Pulse Outputs**

This product also has a detailed supplement (GFK-1643) available.

## 1 SPECIFICATIONS

| INPUT | HSC601 | | | | | | HSC601 |
|---|---|---|---|---|---|---|---|
| Inputs per Module | 8 | | | | | Commons per Module | 1 |
| Programmable Input Voltage Ranges | Zero Crossing | TTL / 5 VDC | 12 VDC | 24 VDC | | Input Type | Positive Logic |
| | | | | | | Peak Voltage | 35 VDC Max. |
| ON Voltage Level | + 0.1 | + 2 | + 8 | + 16 | | Input Impedance | 10K Ohms |
| OFF Voltage Level | - 0.1 | + 0.8 | + 4 | + 8 | | Input Filter | 500KHz, 50KHz, 5KHz |

| OUTPUT | HSC601 | | | HSC601 |
|---|---|---|---|---|
| Outputs per Module | 8 | | Maximum Inrush Current | 650mA |
| Commons per Module | 1 | | Minimum Load | None |
| Operating Voltage | 10 - 28VDC | | OFF to ON Response | 10µs. |
| Output Type | Sourcing / 10K Pull-Down Positive Logic | | ON to OFF Response | 10µs. |
| Peak Voltage | 28VDC Max. | | Output Characteristics | Current Sourcing |
| Maximum Load Current | 0.5A Max. | | Output Protection | Short Circuit |

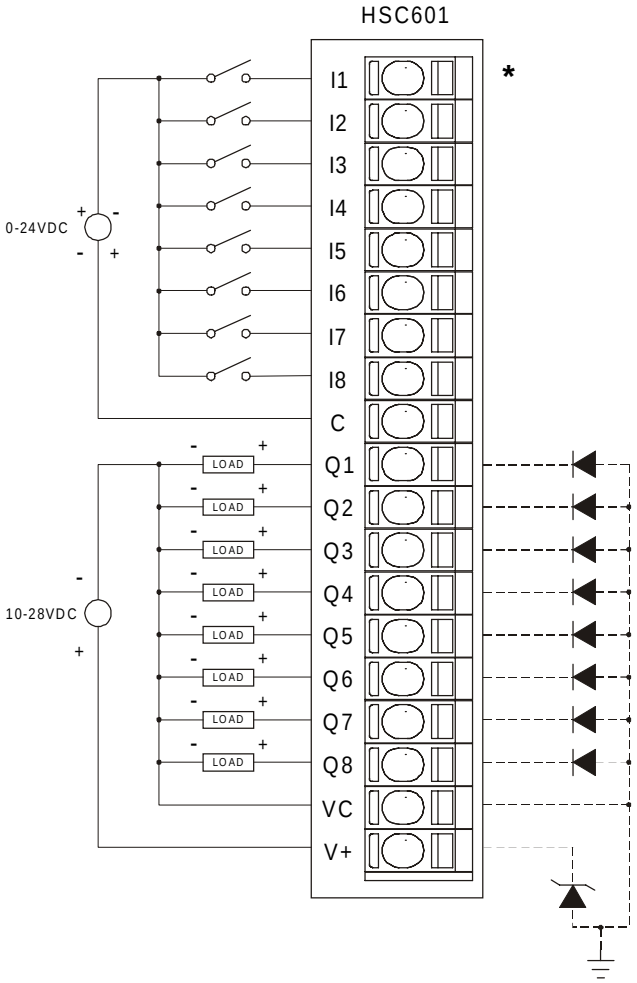
| General Specifications | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.29W (12.43mA @ 24VDC) | CE | Refer to GFK-1755 |
| Required Power (Inrush) | 0.44W (18.4mA @ 24VDC) | UL | Operating Temperature Code T4A; Also refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (270 g) |



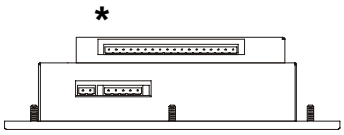
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## 2 WIRING

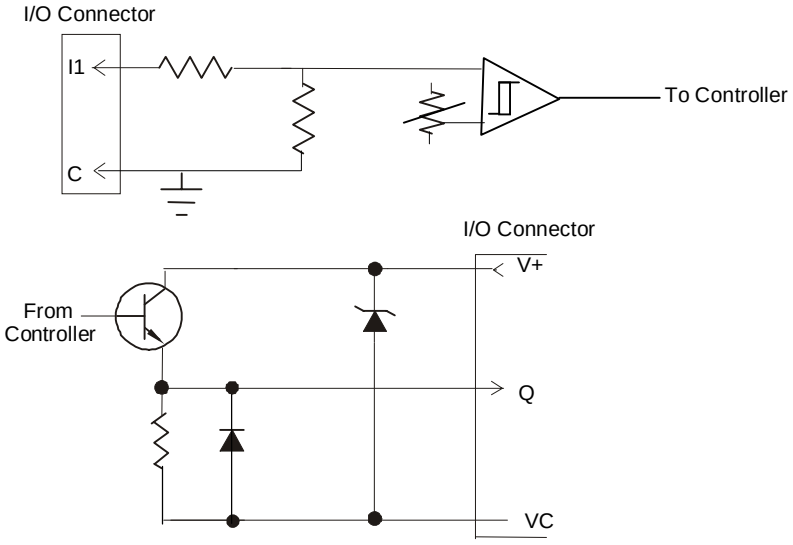



| Pin | Signal HSC601 |
|---|---|
| I1 | Input 1 |
| I2 | Input 2 |
| I3 | Input 3 |
| I4 | Input 4 |
| I5 | Input 5 |
| I6 | Input 6 |
| I7 | Input 7 |
| I8 | Input 8 |
| C | Common |
| Q1 | Output 1 |
| Q2 | Output 2 |
| Q3 | Output 3 |
| Q4 | Output 4 |
| Q5 | Output 5 |
| Q6 | Output 6 |
| Q7 | Output 7 |
| Q8 | Output 8 |
| VC | Common |
| V+ | Load Voltage + |




**OCS Bottom View – Shows corresponding I/O pin location**

## 3 INTERNAL CIRCUIT SCHEMATIC




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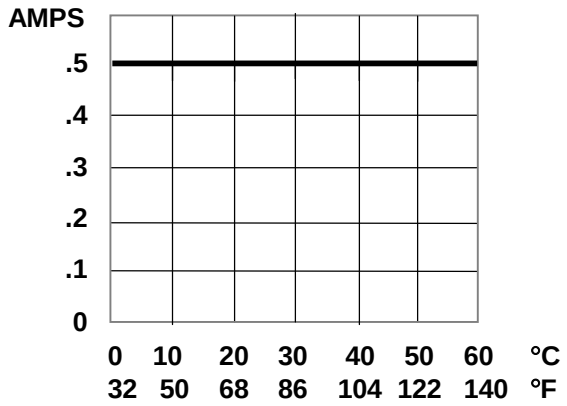
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# 4 CONFIGURATION AND INPUT/OUTPUT MODES

See the Supplement for the High Speed Counter Supplement (GFK-1643) for detailed information covering configuration and input/output modes.

# 5 OUTPUT CHARACTERISTICS

## Derating Chart for IC300HSC601




# 6 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances

# 7 TECHNICAL ASSISTANCE

For user manual updates, contact GE Fanuc PLC Technical Services Hotline at 1-800-433-2682 or visit our website at www.gefanuc.com.


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## NOTES


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# Stepper Positioning Module

## IC300STP100

## Inputs / Outputs

This product has a detailed supplement (GFK-1644) available.

## SPECIFICATIONS

| INPUT | STP100 | | STP100 |
|---|---|---|---|
| **ISOLATED INPUTS** | | | |
| **LOW LEVEL (+2mA)** | | **ISOLATION** | |
| Emergency Stop (ES) | 0 - 9 VDC | Emergency Stop (ES) | 500 VDC min. |
| Home (HO) | | Home (HO) | |
| Index (IN) | | Index (IN) | |
| High Limit (HILIM) | | High Limit (HILIM) | |
| Low Limit (LOLIM) | | Low Limit (LOLIM) | |
| **DIFFERENTIAL INPUTS** | | | |
| Encoder Frequency | 0 - 1.0 MHz | Encoder Differential Threshold Low | -0.2 VDC min. |
| Encoder Single-Ended Threshold | 1.2 – 1.6 VDC | Encoder Differential Threshold High | +0.2 VDC max. |

| OUTPUT | STP100 | | STP100 |
|---|---|---|---|
| **DIFFERENTIAL OUTPUTS** | | | |
| Step Frequency | 0 - 245 KHz | Direction Output Setup Time | 2 ms. max. |
| Step Output High @ -20 mA | 2.5 VDC min. | Direction Output High @ -20 mA | 2.5 VDC min. |
| Step Output Low @ +20 mA | 0.5 VDC max. | Direction Output Low @ +20 mA | 0.5 VDC max. |

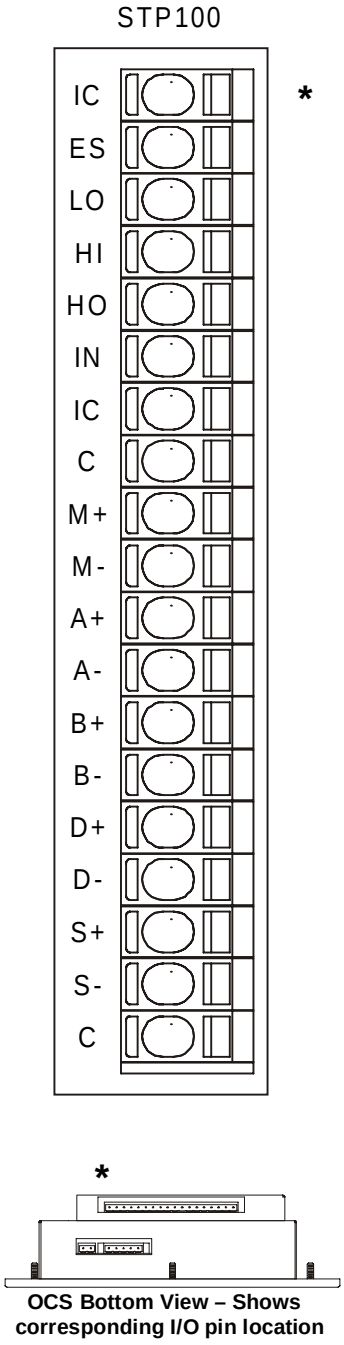
| GENERAL SPECIFICATIONS | | | |
|---|---|---|---|
| Required Power (Steady State) | 0.17W (7.15mA @ 24VDC) | CE | Pending |
| Required Power (Inrush) | 0.38W (16.2mA @ 24VDC) | UL | Refer to GFK-1754 |
| Relative Humidity | 5 to 95% Non-condensing | Terminal Type | Spring Clamp, Removable |
| Operating Temperature | 0° to 60° Celsius | Weight | 9.5 oz. (270 g) |
| Storage Temperature | -40° to +85° Celsius | | |



This Data Sheet (GFK-1624A) is published individually & also as a part of the SmartStack Supplement (GFK-1601A).
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## 2 WIRING




**OCS Bottom View – Shows corresponding I/O pin location**

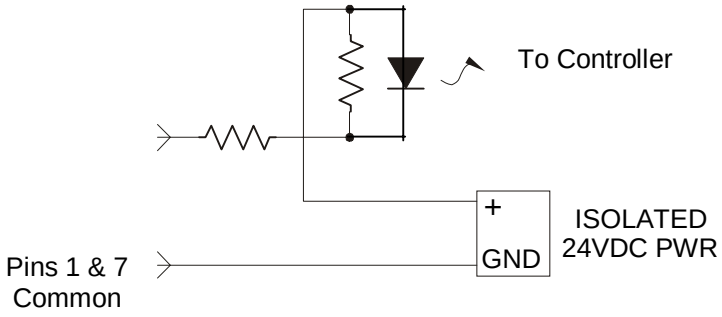
| Pin | Signal | STP100 Description |
|---|---|---|
| **ISOLATED** | | |
| 1 | IC | Isolated Common |
| 2 | ES | ESTOP+<br>Emergency Stop, Active High (Open),<br>24 Vdc Pull Up |
| 3 | LO | LOLIM-<br>Lower limit, Active Low (Closed),<br>24 Vdc Pull Up |
| 4 | HI | HILIM-<br>High limit, Active Low (Closed),<br>24 Vdc Pull Up |
| 5 | HO | HOME-<br>Home, Active Low (Closed),<br>24 Vdc Pull Up |
| 6 | IN | INDEX-<br>Index, Active Low (Closed),<br>24 Vdc Pull Up |
| 7 | IC | Isolated Common |
| **NON-ISOLATED** | | |
| 8 | C | Common<br>Connected internally to bus common |
| 9 | M+ | MARK+<br>Encoder Marker Positive Input |
| 10 | M- | MARK-<br>Encoder Marker Negative Input |
| 11 | A+ | ENC A+<br>Encoder Channel A Positive Input |
| 12 | A- | ENC A-<br>Encoder Channel A Negative Input |
| 13 | B+ | ENC B+<br>Encoder Channel B Positive Input |
| 14 | B- | ENC B-<br>Encoder Channel B Negative Input |
| 15 | D+ | DIR+<br>Direction Positive Output |
| 16 | D- | DIR-<br>Direction Negative Output |
| 17 | S+ | STEP+<br>Step Positive Output |
| 18 | S- | STEP-<br>Step Negative Output |
| 19 | C | Common<br>Connected internally to bus common |



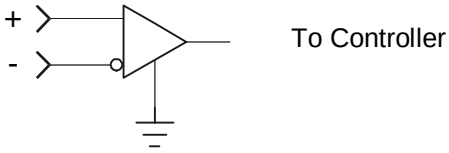
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## 3 INTERNAL CIRCUIT SCHEMATICS

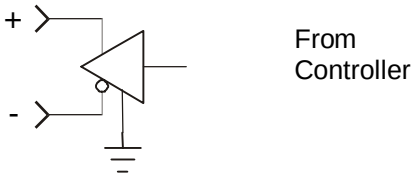
This circuit is typical of **ESTOP+ ,LOLIM-, HILIM-, HOME-, and INDEX-** ***inputs.***




This circuit is typical of **Encoder A, Encoder B, and Marker** ***inputs.***




This circuit is typical of **STEP** and **DIR o*utputs*.**




## 4 CONFIGURATION

See the Supplement for the High Speed Counter Supplement (GFK-1644) for detailed information covering configuration and input/output modes.

## 5 INSTALLATION / SAFETY

All applicable codes and standards are to be followed in the installation of this product.

For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (GFK-1631). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

## 6 TECHNICAL ASSISTANCE

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