# ControlMaster CM15 and CMFXXX

## Universal and fieldmount process indicator ⅛ DIN

## Custom configuration sheet

### 1 Device Setup Level

**Application Template**

**Note.** Please select the template required Based on the build of the instrument, I.e. If the build of the instrument is Extended Functionality, the templates available to select are those displayed under Base and Dual. Only 1 template can be selected per instrument.

**Base** (✔ the box required)

| | |
|---|---|
| Single PV indication | |
| Single PV with Totalizer | |
| Single Totalizer | |
| Single Level with Volume | |

**Dual** (✔ the box required)

| | |
|---|---|
| Dual PV indication | |
| Dual PV with totalizer | |
| Dual Totalizer | |
| Dual Level with Volume | |

| | |
|---|---|
| Instrument Tag: | |

**Mains Frequency** (✔ the box required)

| | |
|---|---|
| 50 Hz | |
| 60 Hz | |

**Level Indicator Only**

**Level 1** (✔ the box required)

| | |
|---|---|
| Specific gravity | |
| Volume Constant | |
| Volume Units | |
| Decimal Places (0, 1, 2, 3 or 4) | |

**Level 2** (✔ the box required)

| | |
|---|---|
| Specific gravity | |
| Volume Constant | |
| Volume Units | |
| Decimal Places (0, 1, 2, 3 or 4) | |

# 2 Display

**Operator Page 1** (✔ the box required)

| | |
|---|---|
| PV1 | |
| PV1 & Totalizer 1 | |
| Totalizer 1 | |
| PV1 & Statistics 1 | |
| PV1 & Volume 1 | |
| Volume 1 | |
| PV2 | |
| PV1 & PV2 | |
| PV2 & Statistics 1 | |
| PV2 & Totalizer 1 | |
| Totalizer 2 | |
| PV1, Totalizer 1, PV2 & Totalizer 2 | |
| Totalizer 1 & Totalizer 2 | |
| PV2 & Volume 2 | |
| PV1, Volume 1, PV2 & Volume 2 | |
| Volume 1 & Volume 2 | |

**Operator Page 2** (✔ the box required)

| | |
|---|---|
| PV1 | |
| PV1 & Totalizer 1 | |
| Totalizer 1 | |
| PV1 & Statistics 1 | |
| PV1 & Volume 1 | |
| Volume 1 | |
| PV2 | |
| PV1 & PV2 | |
| PV2 & Statistics 1 | |
| PV2 & Totalizer 1 | |
| Totalizer 2 | |
| PV1, Totalizer 1, PV2 & Totalizer 2 | |
| Totalizer 1 & Totalizer 2 | |
| PV2 & Volume 2 | |
| PV1, Volume 1, PV2 & Volume 2 | |
| Volume 1 & Volume 2 | |

**Operator Page 3** (✔ the box required)

| | |
|---|---|
| PV1 | |
| PV1 & Totalizer 1 | |
| Totalizer 1 | |
| PV1 & Statistics 1 | |
| PV1 & Volume 1 | |
| Volume 1 | |
| PV2 | |
| PV1 & PV2 | |
| PV2 & Statistics 1 | |
| PV2 & Totalizer 1 | |
| Totalizer 2 | |
| PV1, Totalizer 1, PV2 & Totalizer 2 | |
| Totalizer 1 & Totalizer 2 | |
| PV2 & Volume 2 | |
| PV1, Volume 1, PV2 & Volume 2 | |
| Volume 1 & Volume 2 | |

**Operator Page 4** (✔ the box required)

| | |
|---|---|
| PV1 | |
| PV1 & Totalizer 1 | |
| Totalizer 1 | |
| PV1 & Statistics 1 | |
| PV1 & Volume 1 | |
| Volume 1 | |
| PV2 | |
| PV1 & PV2 | |
| PV2 & Statistics 1 | |
| PV2 & Totalizer 1 | |
| Totalizer 2 | |
| PV1, Totalizer 1, PV2 & Totalizer 2 | |
| Totalizer 1 & Totalizer 2 | |
| PV2 & Volume 2 | |
| PV1, Volume 1, PV2 & Volume 2 | |
| Volume 1 & Volume 2 | |

**Softkey Function** (✔ the box required)

| | |
|---|---|
| Configuration | |
| Scroll View | |
| Alarm Ack | |
| Toggle Signal | |
| Edge Signal | |

**Alarm Ack Enable** (✔ the box required)

| | |
|---|---|
| Enable | |
| Disable | |

**Totalizer Stop/Go** (✔ the box required)

| | |
|---|---|
| Enable | |
| Disable | |

**Totalizer Reset** (✔ the box required)

| | |
|---|---|
| Enable | |
| Disable | |

**Statistics Reset** (✔ the box required)

| | |
|---|---|
| Enable | |
| Disable | |

# 3 Input/Output

**Analog Input 1 – Type** (✔ the box required)

| | |
|---|---|
| Off | |
| Millivolts | |
| Milliamps | |
| Volts | |
| Ohms | |
| Thermocouple | |
| RTD | |
| Volt Free Digital Input | |
| 24 V Digital Input | |
| Frequency Input | |
| Pulse Input | |

| | |
|---|---|
| Electrical Low | |
| Electrical High | |

**Linearizer** (✔ the box required)

| | |
|---|---|
| None | |
| Type B | |
| Type E | |
| Type J | |
| Type K | |
| Type L | |
| Type R | |
| Type S | |
| Type T | |
| PT100 | |
| Square Root | |
| Root 3/2 | |
| Root 5/2 | |

| | |
|---|---|
| Engineering Units* | |

* See “Analog Input Engineering Units” on page 29.

**Decimal Places**

| | |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

| | |
|---|---|
| Engineering Low | |
| Engineering High | |

**Broken Sensor Direction** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

| | |
|---|---|
| Filter Time | |

| | |
|---|---|
| Fault Detect Level | |

**Analog Input 2 – Type** (✔ the box required)

| | |
|---|---|
| Off | |
| Millivolts | |
| Milliamps | |
| Volts | |
| Thermocouple | |
| Volt Free Digital Input | |
| 24 V Digital Input | |

| | |
|---|---|
| Electrical Low | |
| Electrical High | |

**Linearizer** (✔ the box required)

| | |
|---|---|
| None | |
| Type B | |
| Type E | |
| Type J | |
| Type K | |
| Type L | |
| Type R | |
| Type S | |
| Type T | |
| Square Root | |
| Root 3/2 | |
| Root 5/2 | |

| | |
|---|---|
| Engineering Units* | |

* See “Analog Input Engineering Units” on page 29.

**Decimal Places**

| | |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

| | |
|---|---|
| Engineering Low | |
| Engineering High | |

**Broken Sensor Direction** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

| | |
|---|---|
| Filter Time | |

| | |
|---|---|
| Fault Detect Level | |

**Analog Input 3 – Type – CMFXXX ONLY**
(✔ the box required)

| | |
|---|---|
| Off | |
| Millivolts | |
| Milliamps | |
| Volts | |
| Thermocouple | |
| Volt Free Digital Input | |
| 24 V Digital Input | |

| | |
|---|---|
| Electrical Low | |
| Electrical High | |

**Linearizer – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| None | |
| Type B | |
| Type E | |
| Type J | |
| Type K | |
| Type L | |
| Type R | |
| Type S | |
| Type T | |
| Square Root | |
| Root 3/2 | |
| Root 5/2 | |

| | |
|---|---|
| Engineering Units* | |

* See “Analog Input Engineering Units” on page 29.

**Decimal Places – CMFXXX ONLY**

| | |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

| | |
|---|---|
| Engineering Low | |
| Engineering High | |

**Broken Sensor Direction – CMFXXX ONLY**
(✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

| | |
|---|---|
| Filter Time | |

| | |
|---|---|
| Fault Detect Level | |

**Analog Input 4 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Off | |
| Millivolts | |
| Milliamps | |
| Volts | |
| Thermocouple | |
| Volt Free Digital Input | |
| 24 V Digital Input | |

| | |
|---|---|
| Electrical Low | |
| Electrical High | |

**Linearizer – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| None | |
| Type B | |
| Type E | |
| Type J | |
| Type K | |
| Type L | |
| Type R | |
| Type S | |
| Type T | |
| Square Root | |
| Root 3/2 | |
| Root 5/2 | |

| | |
|---|---|
| Engineering Units* | |

* See “Analog Input Engineering Units” on page 29.

**Decimal Places – CMFXXX ONLY**

| | |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

| | |
|---|---|
| Engineering Low | |
| Engineering High | |

**Broken Sensor Direction – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

| | |
|---|---|
| Filter Time | |

| | |
|---|---|
| Fault Detect Level | |

**Analog Output 1 – Type** (✔ the box required)

| | |
|---|---|
| Analog | |
| Digital | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Electrical Low* | |
| Electrical High* | |

*Analog Output only

**Auto Engineering Range*** (✔ the box required)

| | |
|---|---|
| On | |
| Off | |

| | |
|---|---|
| Engineering Low* | |
| Engineering High* | |

*Analog Output only

**Polarity**** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital Output only

**Analog Output 2 – Type** (✔ the box required)

| | |
|---|---|
| Analog | |
| Digital | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Electrical Low* | |
| Electrical High* | |

*Analog Output only

**Auto Engineering Range*** (✔ the box required)

| | |
|---|---|
| On | |
| Off | |

*Analog Output only

| | |
|---|---|
| Engineering Low* | |
| Engineering High* | |

*Analog Output only

**Polarity**** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital Output only

**Analog Output 3 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Analog | |
| Digital | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Electrical Low* | |
| Electrical High* | |

*Analog Output only

**Auto Engineering Range* – CMFXXX ONLY**
(✔ the box required)

| | |
|---|---|
| On | |
| Off | |

*Analog Output only

| | |
|---|---|
| Engineering Low* | |
| Engineering High* | |

*Analog Output only

**Polarity** – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital Output only

**Analog Output 4 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Analog | |
| Digital | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Electrical Low* | |
| Electrical High* | |

*Analog Output only

**Auto Engineering Range* – CMFXXX ONLY**
(✔ the box required)

| | |
|---|---|
| On | |
| Off | |

*Analog Output only

| | |
|---|---|
| Engineering Low* | |
| Engineering High* | |

*Analog Output only

**Polarity** – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital Output only

**Digital I/O 1 – Type** (✔ the box required)

| | |
|---|---|
| Off | |
| Output | |
| Volt Free Digital Input | |
| 24 V Input | |
| TTL | |

| | |
|---|---|
| Digital Output Source** | |

** See “Digital Sources” on page 27.

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital I/O 2 – Type** (✔ the box required)

| | |
|---|---|
| Off | |
| Output | |
| Volt Free Digital Input | |
| 24 V Input | |
| TTL | |

| | |
|---|---|
| Digital Output Source** | |

** See “Digital Sources” on page 27.

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital I/O 3 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Off | |
| Output | |
| Volt Free Digital Input | |
| 24 V Input | |
| TTL | |

| | |
|---|---|
| Digital Output Source** | |

** See “Digital Sources” on page 27.

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital I/O 4 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Off | |
| Output | |
| Volt Free Digital Input | |
| 24 V Input | |
| TTL | |

| | |
|---|---|
| Digital Output Source** | |

** See “Digital Sources” on page 27.

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital I/O 5 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Off | |
| Output | |
| Volt Free Digital Input | |
| 24 V Input | |
| TTL | |

| | |
|---|---|
| Digital Output Source** | |

** See “Digital Sources” on page 27.

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Digital I/O 6 – Type – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Off | |
| Output | |
| Volt Free Digital Input | |
| 24 V Input | |
| TTL | |

| | |
|---|---|
| Digital Output Source** | |

** See “Digital Sources” on page 27.

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Relay 1**

| | |
|---|---|
| Source*** | |

***See page 27

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Relay 2**

| | |
|---|---|
| Source*** | |

***See page 27

**Polarity** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Relay 3 – CMFXXX ONLY**

| | |
|---|---|
| Source*** | |

***See page 27

**Polarity – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Relay 4 – CMFXXX ONLY**

| | |
|---|---|
| Source*** | |

***See page 27

**Polarity – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Relay 5 – CMFXXX ONLY**

| | |
|---|---|
| Source*** | |

***See page 27

**Polarity – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

**Relay 6 – CMFXXX ONLY**

| | |
|---|---|
| Source*** | |

***See page 27

**Polarity – CMFXXX ONLY** (✔ the box required)

| | |
|---|---|
| Positive | |
| Negative | |

# 4 Process Alarms

**Alarm 1 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 3 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 2 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 4 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 5 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 7 – Type** (4 the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 6 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

**Alarm 8 – Type** (✔ the box required)

| | |
|---|---|
| High Process | |
| Low Process | |
| High Latch | |
| Low Latch | |

| | |
|---|---|
| Tag: | |

| | |
|---|---|
| Source* | |

* See “Analog Sources” on page 28.

| | |
|---|---|
| Trip | |

| | |
|---|---|
| Hysteresis | |
| Time Hysteresis | |

# 5 Totalizer Configuration

**Totalizer 1 – Mode** (✔ the box required)

| | |
|---|---|
| Off | |
| Analog | |
| Digital | |
| Frequency | |
| Pulse | |

| | |
|---|---|
| Source** | |

** Set source from“Digital Sources” on page 27 and “Analog Sources” on page 28.

**Totalizer 2 – Mode** (✔ the box required)

| | |
|---|---|
| Off | |
| Analog | |
| Digital | |
| Frequency | |
| Pulse | |

| | |
|---|---|
| Source** | |

** Set source from“Digital Sources” on page 27 and “Analog Sources” on page 28.

**Count Direction** (✔ the box required)

| | |
|---|---|
| Up | |
| Down | |

| | |
|---|---|
| Units | |

| | |
|---|---|
| Count Rate | |
| Cut off | |
| Stop/Go Source | |
| Decimal Places (0, 1, 2, 3 or 4) | |
| Wrap (On or Off) | |
| Reset Source | |

**Count Direction** (✔ the box required)

| | |
|---|---|
| Up | |
| Down | |

| | |
|---|---|
| Units | |

| | |
|---|---|
| Count Rate (if known) | |
| Cut off | |
| Stop/Go Source | |
| Decimal Places (0, 1, 2, 3 or 4) | |
| Wrap (On or Off) | |
| Reset Source | |

# 6 Functions

## Logic Equations

**Logic Equation 1** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 3** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 2** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 4** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 5** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 7** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 6 (x** if not inverted***)**

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

**Logic Equation 8** (**x** if not inverted*)

| | | |
|---|---|---|
| Operand 1 | | Invert* |
| Operator 1 | | |
| Operand 2 | | Invert* |
| Operator 2 | | |
| Operand 3 | | Invert* |
| Operator 3 | | |
| Operand 4 | | Invert* |
| Operator 4 | | |
| Operand 5 | | Invert* |
| Operator 5 | | |
| Operand 6 | | Invert* |
| Operator 6 | | |
| Operand 7 | | Invert* |
| Operator 7 | | |
| Operand 8 | | Invert* |

## Math Blocks

Math Block 1

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 2

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 3

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 4

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 5

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 6

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 7

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

**…Math Blocks (continued)**

Math Block 8

**Math Block Type** (✔ the box required)

| | |
|---|---|
| Equation | |
| Real Time Average | |
| Max Hold | |
| Min Hold | |
| Multiplexer | |
| Square Root | |

**For all Math Block Types**

| | |
|---|---|
| Eng. Decimal Places | |
| Engineering Low | |
| Engineering High | |
| Engineering Units | |

**Fault Action** (✔ the box required)

| | |
|---|---|
| None | |
| Automatic | |
| Upscale | |
| Downscale | |

**Equation Type Setup**

| | |
|---|---|
| Operand 1 | |
| Operator 1 | |
| Operand 2 | |
| Operator 2 | |
| Operand 3 | |
| Operator 3 | |
| Operand 4 | |

**Selectable Operators**

| | | | |
|---|---|---|---|
| End | Subtract | Divide | High Select |
| Add | Multiply | Low Select | Median |

**Real Time Average Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |
| Average Duration | |

**Max/Min Hold Setup**

| | |
|---|---|
| Operand 1 | |
| Reset Source | |

**Multiplexer Setup**

| | |
|---|---|
| Operand 1 (A) | |
| Operand 1 Constant | |
| Operand 2 (B) | |
| Operand 2 Constant | |
| Mux Selector Source | |

**Square Root Setup**

| | |
|---|---|
| Operand 1 | |

## Custom Linearizer

Custom Linearizer 1

| Source | |
|---|---|

**Break Points**

(If % known please complete if not completed by factory)

| Number | Eng. Range | % | Elect. Range | % |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |

Custom Linearizer 2

| Source | |
|---|---|

**Break Points**

(If % known please complete if not completed by factory)

| Number | Eng. Range | % | Elect. Range | % |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |

## Delay Timers

### Delay Timer 1

| | |
|---|---|
| Source | |
| Delay Time | |
| On Time | |

### Delay Timer 2

| | |
|---|---|
| Source | |
| Delay Time | |
| On Time | |

## Real Time Alarms

### Real Time Alarm 1

| | |
|---|---|
| Monday (✔) | |
| Tuesday (✔) | |
| Wednesday (✔) | |
| THursday (✔) | |
| Friday (✔) | |
| Saturday (✔) | |
| Sunday (✔) | |
| Month Enable | |
| Every Hour | |
| On Hour | |
| On Minute | |
| Duration | |
| Display Enable | |
| Tag | |

### Real Time Alarm 2

| | |
|---|---|
| Monday (✔) | |
| Tuesday (✔) | |
| Wednesday (✔) | |
| THursday (✔) | |
| Friday (✔) | |
| Saturday (✔) | |
| Sunday (✔) | |
| Month Enable | |
| Every Hour | |
| On Hour | |
| On Minute | |
| Duration | |
| Display Enable | |
| Tag | |

# 7 Communications

## RS485

**Mode** (✔ the box required)

| | |
|---|---|
| Off | |
| 2-Wire | |
| 4-Wire | |

| | |
|---|---|
| Baud Rate | |
| Parity | |
| Tx Delay | |

## Ethernet

**DHCP Implementation** (✔ the box required)

| | |
|---|---|
| On | |
| Off | |

| | |
|---|---|
| IP Address | |
| Subnet Mask | |
| Default Gateway | |

## Email

| | |
|---|---|
| SMTP Server | |
| Email 1 | |
| Email 2 | |
| Email 3 | |

| | | |
|---|---|---|
| Tag 1 | | |
| Trigger 1 | | Invert |
| Tag 2 | | |
| Trigger 2 | | Invert |
| Tag 3 | | |
| Trigger 3 | | Invert |
| Tag 4 | | |
| Trigger 4 | | Invert |

## Modbus TCP

**Implementation**

| | |
|---|---|
| Off | |
| Server | |

**Connections** (✔ the box required)

| | |
|---|---|
| 1 | |
| 2 | |
| 3 | |

**Client Authority**

| | |
|---|---|
| Unrestricted | |
| Authorised 1 | |
| Authorised 2 | |
| Authorised 3 | |

# 8 Digital Sources

| Source Name | Description [Comment] |
|---|---|
| Alarm 1 (8) Ack. State | Acknowledged alarm = 0<br>Unacknowledged alarm = 1 |
| Alarm 1 (8) State | Alarm state |
| Anlg IP 1 (4) Fail | Analog Input Failure (active when the signal detected at the analog input is outside the fault detect level specified during configuration). |
| AO1 (2) Loop Break | Analog output |
| Delay Timer 1 (2) | Delay timer state |
| IP 1 (4) Digital State | Input 1 (4) digital state |
| Linearizer 1 (2) Fail | Custom linearizer failure |
| Logic Equation 1 (8) | Logic equation result |
| Loop 1 SP Mode | Setpoint mode selected<br>0 = Local, 1 = Remote |
| Loop 1 Auto Mode | Automatic control mode |
| Loop 1 Close Relay | Motorized valve close relay state |
| Loop 1 LSP 1 (4) State | Local setpoint state<br>1 = setpoint selected |
| Loop 1 Manual Mode | Manual control mode<br>1 = Manual |

| Source Name | Description [Comment] |
|---|---|
| Loop 1 Open Relay | Motorized valve open relay state |
| Loop 1 TP OP1 | Time proportioning output |
| Loop 1 Valve State | Motorized valve state |
| Loop 1 Valve Stuck | Motorized valve stuck state |
| Loop 1 Ctrl Track | Control track state |
| Math Block 1 (8) Fail | Maths failure |
| RTA 1 (2) State | Real time alarm state |
| Softkey Toggle | Front panel soft key toggles the source's state |
| Softkey Edge | Front panel soft key sets the source active on key press |
| T1 (2) Int Pulse | Totalizer intermediate pulse – active for 1 second when the intermediate count is reached |
| T1 (2) Run State | Totalizer run state<br>1 = Totalizer running |
| T1 (2) Wrap Pulse | Totalizer wrap pulse<br>If *Wrap Enable* is *On* – active for 1 second when the predetermined count is reached<br>*Off* – active when the predetermined count has been reached and remains active until the totalizer is reset |

# 9 Analog Sources

| Source Name | Description |
|---|---|
| Anlg IP 1 (4) | Analog input |
| Constant 1 (8) | Math block constant |
| Linearizer 1 (2) | Custom linearizer |
| Loop 1 Actual Ratio | Loop 1 (2) actual ratio. Applies to ratio application templates only |
| Loop 1 Control OP | Control output value |
| Loop 1 Deviation | Loop 1 (2) deviation |
| Loop 1 Feedforward | Loop 1 (2) output of feedforward block |
| Loop 1 LSP | Local setpoint loop |
| Loop 1 PV | Loop 1 (2) process variable |
| Loop 1 Ration | Loop 1 (2) desired ratio Loop |
| Loop 1 SP | Loop control setpoint |
| Loop 1 Split OP1 | Loop 1 split output |
| Loop 1 Valve Pos | Motorized valve position |
| Loop Bias 1 | Loop 1 desired bias |
| Math Block 1 (8) | Math block |
| PV1 (2) Average | Process variable average |
| PV1 (2) Max | Maximum value of process variable 1 (2) |
| PV1 (2) Min | Minimum value of process variable 1 (2) |
| T1 (2) Batch Total | Totalizer batch total |
| T1 (2) Secure Total | Totalizer secure total |
| User Value 1 (2) | (Profile only) |
| Volume 1 (2) | (Indicator only) |

# 10 Analog Input Engineering Units

| Unit | Description |
|---|---|
| % | % |
| % sat | % saturation |
| %dO2 | % dissolved oxygen |
| %HCl | % hydrochloric acid |
| %N2 | % nitrogen |
| %O2 | % oxygen |
| %OBS | % obscuration |
| %RH | % relative humidity |
| A | amps |
| bar | bar |
| CUMEC | cubic metre per second |
| deg C / F | degrees Celsius / Fahrenheit |
| Feet | imperial feet |
| $ft^3/d$, $ft^3/h$, $ft^3/m$, $ft^3/s$ | cubic feet per day, hour, minute, second. |
| FTU | formazine turbidity units |
| g/d, g/h, g/l | grams per day, hour, liter |
| gal/d (UK) | imperial gallons per day |
| gal/d (US) | US gallons per day |
| gal/h (UK) / (US) | imperial / US gallons per hour |
| gal/m, s (UK) / (US) | imperial / US gallons per minute, second. |
| Hz | hertz |
| Inches | imperial inches |
| Kelvin | degrees Kelvin |
| kg/d, kg/h, kg/m | kilograms per day, hr., min. |
| kg/s | kilograms per sec. |
| kHz | kilohertz |
| l/d, l/h, l/m, l/s | liters per day, hour, min., sec. |
| lb/d, lb/h, lb/m, lb/s | pounds per day, hour, minute, second. |

| Unit | Description |
|---|---|
| m WG | meters water gauge |
| $m^3/d$, $m^3/h$, $m^3/m$, $m^3/s$ | cubic meters per day, hour, minute, second.. |
| mbar | millibar |
| mg/kg | milligrams per kilogram |
| Mgal/d (UK) | imperial mega gallons per day |
| Mgal/d (US) | US mega gallons per day |
| mho | conductance |
| Ml/d, Ml/h | megaliters per day, hour. |
| ml/h, ml/m | millilitres per hour, minute. |
| Ml/s | megaliters per second |
| mS/cm, mS/m | milliSiemens per centimeter, meter |
| mV | millivolts |
| MV | megavolts |
| NTU | nephelometric turbidity units |
| pb | parts per billion |
| pH | potential Hydrogen |
| pm | parts per million |
| psi | pounds per square inch |
| S | Siemens |
| SCFM | standard cubic feet per minute |
| T/d, T/h, T/m | metric tonnes per day, hour, minute. |
| T/s | metric tonnes per second |
| ton/d, ton/h, ton/m, ton/s | imperial tons per day, hour, minute, second. |
| ug/kg | micrograms per kilogram |
| uS/cm, uS/m | microSiemens per centimeter / meter |
| uV | microvolts |

# 11 Notes

**ABB Limited**
**Measurement & Analytics**
Howard Road
St. Neots
Cambridgeshire
PE19 8EU
UK
Tel: +44 (0)1480 475 321
Fax: +44 (0)1480 217 948
Email: instrumentation@gb.abb.com

**ABB Inc.**
**Measurement & Analytics**
125 E. County Line Road
Warminster
PA 18974
USA
Tel: +1 215 674 6000
Fax: +1 215 674 7183

**abb.com/measurement**



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