# Specification of MiroComponents and Sensors

MiroCorp

September 2020

# 1  Mounting Components

This section covers Blueprints, Properties and Models of existing MiroComponents.

**Blueprint:** Shows a drawing of the component template including preconfigured mounting points.

**Properties:** Descriptive name and material properties.

**Models:** Table with different variations with unique measurements based on the Blueprint. All lengths are in cm.
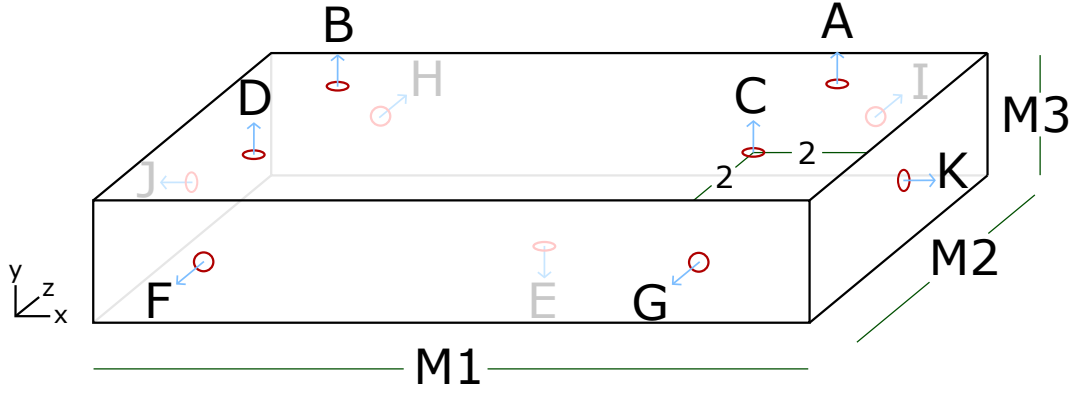
## 1.1 MC0XX



Figure 1: Blueprint MC0XX

Table 1: Properties MC0XX

| Name | Mounting Plate |
|---|---|
| Material | ABS Plastic |
| Density | $950 kg/m^3$ |

Table 2: Models MC0XX

| Model nr | M1 | M2 | M3 | Model nr | M1 | M2 | M3 |
|---|---|---|---|---|---|---|---|
| MC011 | 8 | 8 | 2 | MC041 | 8 | 20 | 2 |
| MC012 | 12 | 8 | 2 | MC042 | 12 | 20 | 2 |
| MC013 | 16 | 8 | 2 | MC043 | 16 | 20 | 2 |
| MC014 | 20 | 8 | 2 | MC044 | 20 | 20 | 2 |
| MC015 | 24 | 8 | 2 | MC045 | 24 | 20 | 2 |
| MC021 | 8 | 12 | 2 | MC051 | 8 | 24 | 2 |
| MC022 | 12 | 12 | 2 | MC052 | 12 | 24 | 2 |
| MC023 | 16 | 12 | 2 | MC053 | 16 | 24 | 2 |
| MC024 | 20 | 12 | 2 | MC054 | 20 | 24 | 2 |
| MC025 | 24 | 12 | 2 | MC055 | 24 | 24 | 2 |
| MC031 | 8 | 16 | 2 | MC091 | 8 | 8 | 6 |
| MC032 | 12 | 16 | 2 | MC092 | 12 | 12 | 6 |
| MC033 | 16 | 16 | 2 | MC093 | 16 | 16 | 6 |
| MC034 | 20 | 16 | 2 | MC094 | 20 | 20 | 6 |
| MC035 | 24 | 16 | 2 | MC095 | 24 | 24 | 6 |

## 1.2 MC1XX
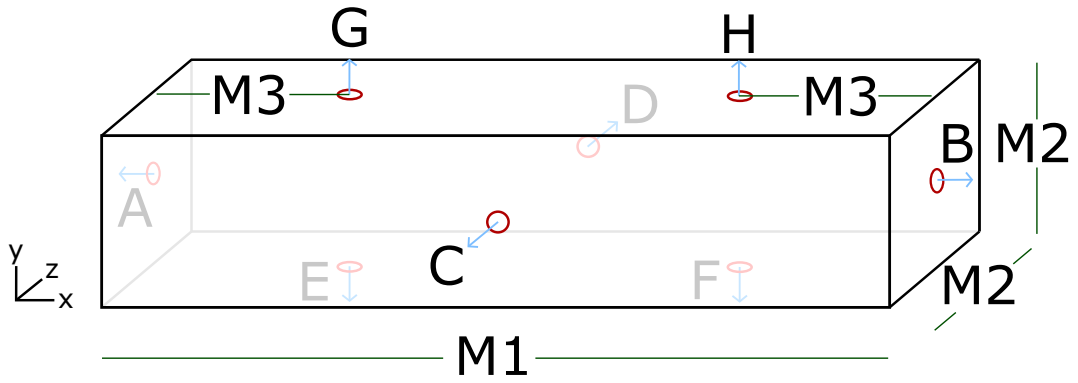


Figure 2: Blueprint MC1XX

Table 3: Properties MC1XX

| Name | Solid bar |
|---|---|
| Material | Aluminium |
| Density | $2700 kg/m^3$ |

Table 4: Models MC1XX

| Model nr | M1 | M2 | M3 | Model nr | M1 | M2 | M3 |
|---|---|---|---|---|---|---|---|
| MC111 | 8 | 2 | 2 | MC131 | 50 | 6 | 8 |
| MC112 | 12 | 2 | 2 | MC132 | 75 | 6 | 8 |
| MC113 | 16 | 2 | 2 | MC133 | 100 | 6 | 8 |
| MC114 | 20 | 2 | 2 | MC134 | 125 | 6 | 8 |
| MC115 | 24 | 2 | 2 | MC135 | 150 | 6 | 8 |
| MC121 | 16 | 4 | 4 | MC141 | 100 | 8 | 12 |
| MC122 | 20 | 4 | 4 | MC142 | 150 | 8 | 12 |
| MC123 | 24 | 4 | 4 | MC143 | 200 | 8 | 12 |
| MC124 | 36 | 4 | 4 | MC144 | 250 | 8 | 12 |
| MC125 | 48 | 4 | 4 | MC145 | 300 | 8 | 126 |

## 1.3 MC2XX
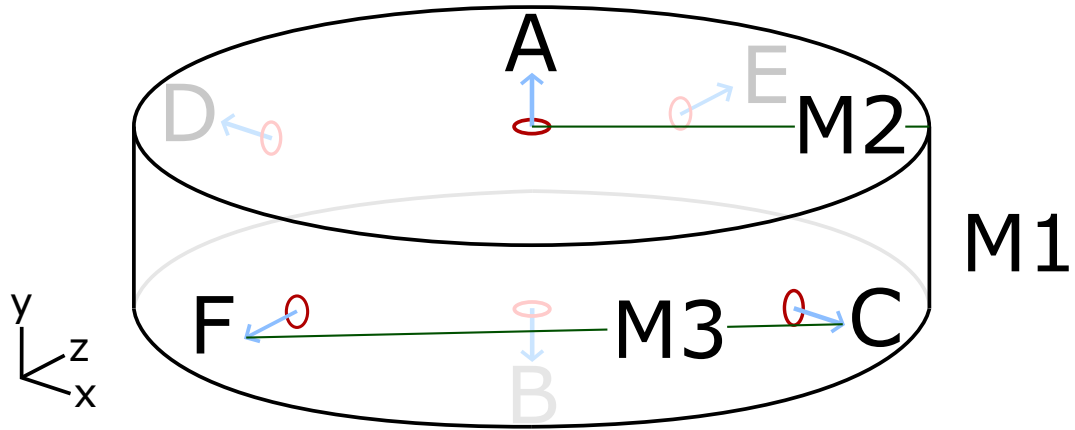


Figure 3: Blueprint MC2XX

Table 5: Properties MC2XX

| Name | Mounting puck |
|---|---|
| Material | ABS Plastic |
| Density | $950 kg/m^3$ |

Table 6: Models MC2XX

| Model nr | M1 | M2 | M3 | Model nr | M1 | M2 | M3 |
|---|---|---|---|---|---|---|---|
| MC211 | 2.5 | 1 | 2.83 | MC241 | 2 | 1.8 | 4 |
| MC212 | 5 | 2 | 2.83 | MC242 | 2 | 4.7 | 8 |
| MC213 | 8 | 2 | 2.83 | MC243 | 2 | 7.5 | 12 |
| MC214 | 12 | 2 | 2.83 | MC244 | 2 | 10.3 | 16 |
| MC215 | 16 | 2 | 2.83 | MC245 | 2 | 13.1 | 20 |
| MC221 | 2.5 | 2 | 2.83 | MC251 | 4 | 1.8 | 4 |
| MC222 | 5 | 2 | 4.25 | MC252 | 4 | 4.7 | 8 |
| MC223 | 8 | 2 | 4.25 | MC253 | 4 | 7.5 | 12 |
| MC224 | 12 | 2 | 4.25 | MC254 | 4 | 10.3 | 16 |
| MC225 | 16 | 2 | 4.25 | MC255 | 4 | 13.1 | 20 |
| MC231 | 2.5 | 4 | 7.07 | MC261 | 8 | 1.8 | 4 |
| MC232 | 5 | 4 | 7.07 | MC262 | 8 | 4.7 | 8 |
| MC233 | 8 | 4 | 7.07 | MC263 | 8 | 7.5 | 12 |
| MC234 | 12 | 4 | 7.07 | MC264 | 8 | 10.3 | 16 |
| MC235 | 16 | 4 | 7.07 | MC265 | 8 | 13.1 | 20 |

## 1.4 MC3XX
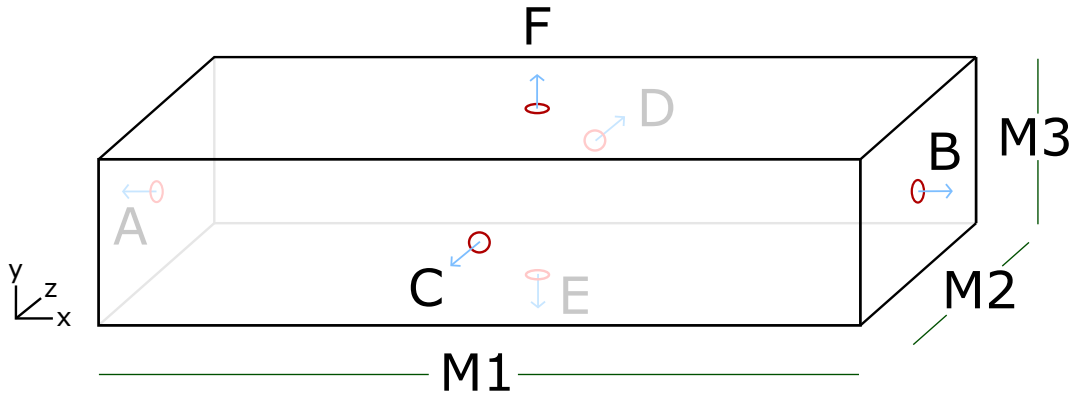


Figure 4: Blueprint MC3XX

Table 7: Properties MC3XX

| Name | Detail connector |
|------|------------------|
| Material | PVC Plastic |
| Density | $1380 kg/m^3$ |

Table 8: Models MC3XX

| Model nr | M1 | M2 | M3 |
|----------|-----|-----|-----|
| MC311 | 0.5 | 0.5 | 0.5 |
| MC312 | 1 | 0.5 | 0.5 |
| MC313 | 2 | 0.5 | 0.5 |
| MC314 | 4 | 0.5 | 0.5 |
| MC315 | 6 | 0.5 | 0.5 |
| MC321 | 0.5 | 1 | 1 |
| MC322 | 1 | 1 | 1 |
| MC323 | 2 | 1 | 1 |
| MC324 | 4 | 1 | 1 |
| MC325 | 6 | 1 | 1 |
| MC326 | 8 | 1 | 1 |
| MC327 | 10 | 1 | 1 |
| MC333 | 2 | 2 | 1 |
| MC334 | 4 | 2 | 1 |
| MC335 | 6 | 2 | 1 |
| MC336 | 8 | 2 | 1 |
| MC337 | 10 | 2 | 1 |

## 1.5 MC4XX
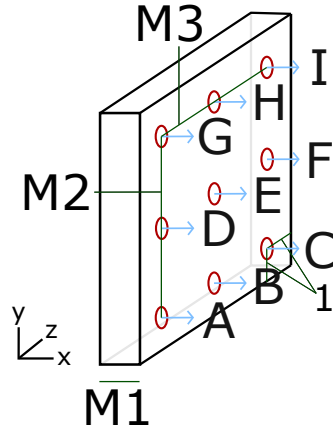


Figure 5: Blueprint MC4XX

Table 9: Properties MC4XX

| Name | Cover Plate |
|---|---|
| Material | PVC Plastic |
| Density | $1380 kg/m^3$ |

Table 10: Models MC4XX

| Model nr | M1 | M2 | M3 | Model nr | M1 | M2 | M3 |
|---|---|---|---|---|---|---|---|
| MC411 | 0.5 | 6 | 6 | MC439 | 0.5 | 10 | 22 |
| MC412 | 0.5 | 6 | 8 | MC444 | 0.5 | 12 | 12 |
| MC413 | 0.5 | 6 | 10 | MC445 | 0.5 | 12 | 14 |
| MC414 | 0.5 | 6 | 12 | MC446 | 0.5 | 12 | 16 |
| MC415 | 0.5 | 6 | 14 | MC447 | 0.5 | 12 | 18 |
| MC416 | 0.5 | 6 | 16 | MC448 | 0.5 | 12 | 20 |
| MC417 | 0.5 | 6 | 18 | MC449 | 0.5 | 12 | 22 |
| MC418 | 0.5 | 6 | 20 | MC455 | 0.5 | 14 | 14 |
| MC419 | 0.5 | 6 | 22 | MC456 | 0.5 | 14 | 16 |
| MC422 | 0.5 | 8 | 8 | MC457 | 0.5 | 14 | 18 |
| MC423 | 0.5 | 8 | 10 | MC458 | 0.5 | 14 | 20 |
| MC424 | 0.5 | 8 | 12 | MC459 | 0.5 | 14 | 22 |
| MC425 | 0.5 | 8 | 14 | MC466 | 0.5 | 16 | 16 |
| MC426 | 0.5 | 8 | 16 | MC467 | 0.5 | 16 | 18 |
| MC427 | 0.5 | 8 | 18 | MC468 | 0.5 | 16 | 20 |
| MC428 | 0.5 | 8 | 20 | MC469 | 0.5 | 16 | 22 |
| MC429 | 0.5 | 8 | 22 | MC477 | 0.5 | 18 | 18 |
| MC433 | 0.5 | 10 | 10 | MC478 | 0.5 | 18 | 20 |
| MC434 | 0.5 | 10 | 12 | MC479 | 0.5 | 18 | 22 |
| MC435 | 0.5 | 10 | 14 | MC488 | 0.5 | 20 | 20 |
| MC436 | 0.5 | 10 | 16 | MC489 | 0.5 | 20 | 22 |
| MC437 | 0.5 | 10 | 18 | MC499 | 0.5 | 22 | 22 |
| MC438 | 0.5 | 10 | 20 | | | | |

## 1.6 MC9XX

These components are built from steel enforged concrete and are too heavy and too big to use in portable modules. They are designed for other purposes.

# 2 Sensors

## 2.1 Sensor Chassis

All virtual MiroSensors are built in a chassis from the blueprint in figure 6. They use the same linking system as mounting components with only one linkpoint, named *'Linkpoint'*. Dimensions are in cm.
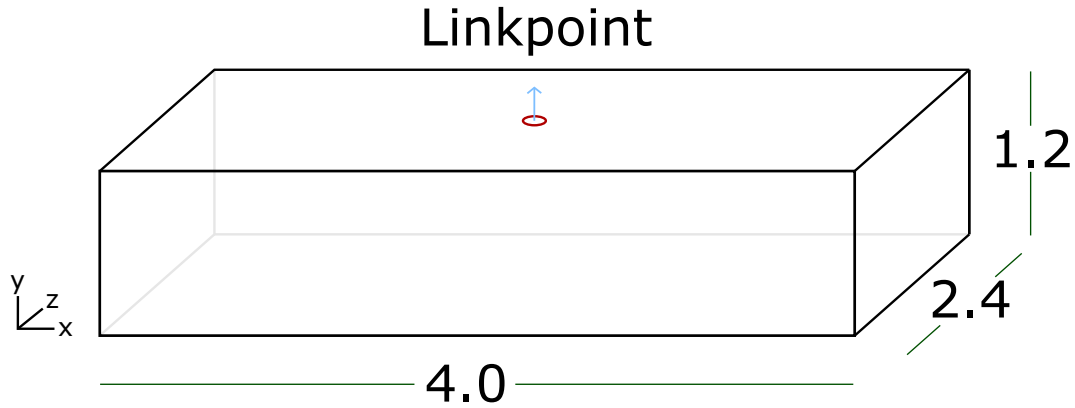
## Linkpoint



Figure 6: Blueprint MiroSensor Chassis

## 2.2 Sensor Types

**Accelerometer:** Gives the average acceleration in x, y and z during the last cycle. A Polling rate of $P_r = 100Hz$ and a reading of $a = 10m/s^2$ means that the acceleration $a$ has been applied to the sensor during $1/100 = 0.01$ seconds.

**Speedometer:** Gives a vector of velocity in x, y and z.

**Odometer:** Gives current position relative starting point.

## 2.3 Sensor Models

Table 11: Properties MC4XX

| Sensor | Type | Information |
|--------|------|-------------|
| MSA01 | Accelerometer | Polling rate: 120 Hz |
| MSA02 | Accelerometer | Polling rate: 300 Hz |
| MSV01 | Speedometer | |
| MSO01 | Odometer | |