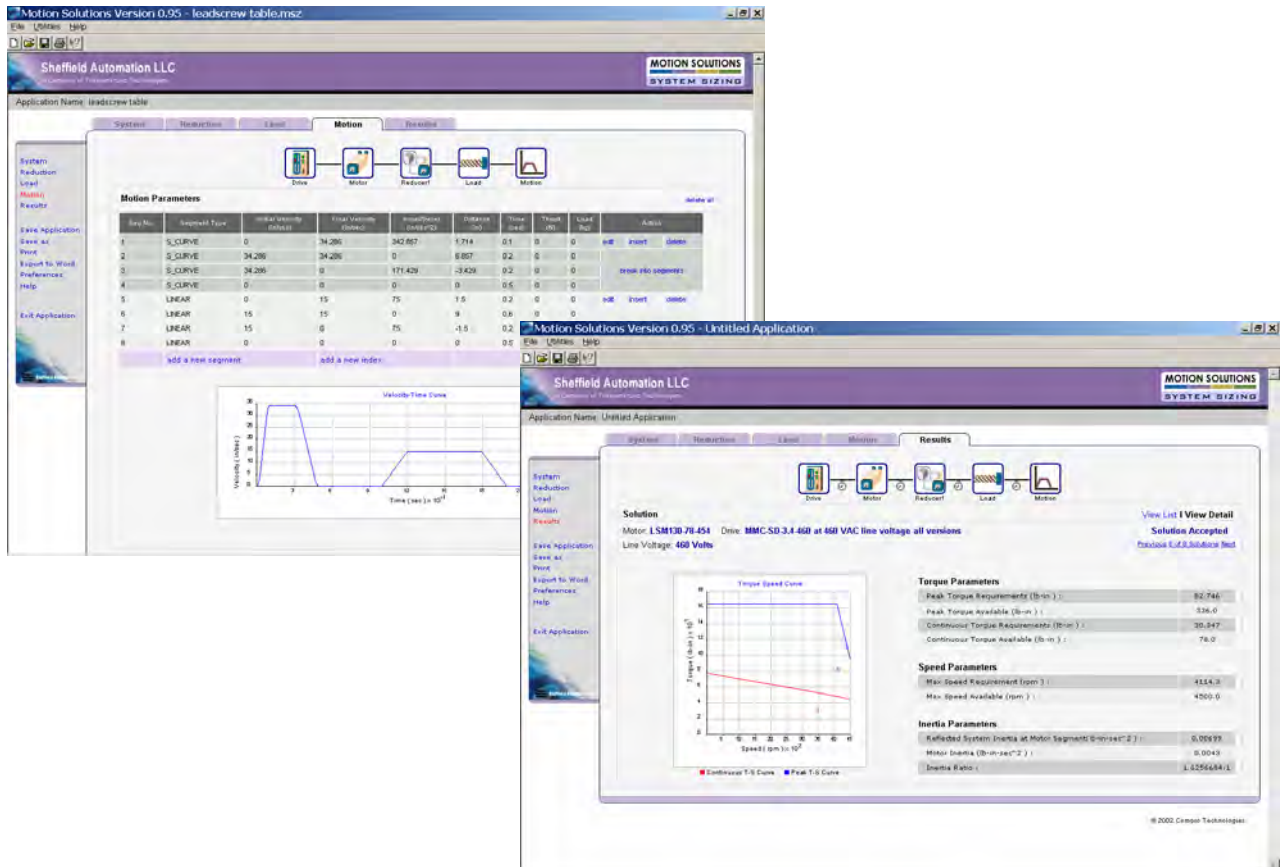## Digital MMC System Component Selection

Use the G&L Motion Control Motion Solutions Sizing Software to select the right MMC Smart Drive servo amplifiers and motors for your application.

Define Application

Identify Valid Motor/Drive Combination

Once the Drive and Motor models have been identified for all the axes in the system, follow the steps below to choose the components required to complete your Digital MMC system.

Select Digital MMC model and options
1 – Control Model
2 – Control Accessories
3 – Programming Software

Select MMC Smart Drive
4 - Drive Model and Option(s)
5 - Drive Accessories

Select Servo Motor
6 - Motor Model

Select MMC Smart Drive Interface Cables/Components
7 - Drive to Motor Power Interface
8 - Drive to Motor Feedback Interface
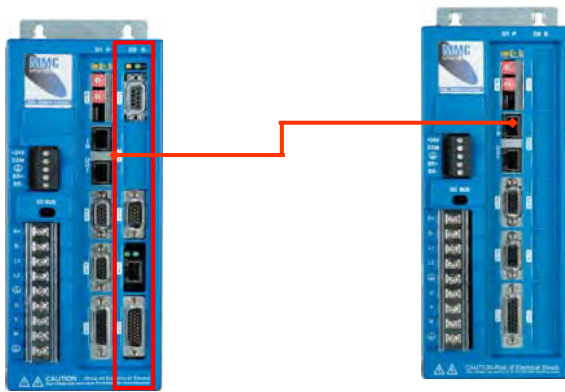9 - Drive to I/O Interface

1 - Select Digital MMC Control Model

The model to use depends on the number of axes that are to be controlled. All available models are listed in the table below.

The MMC-D1, D2, D4 and D16 Digital MMC controls are installed inside an MMC Smart Drive. The control is field installable. The MMC-D2, D-4 and D-16 can control additional amplifiers besides the one the Digital MMC is installed in (i.e. you only need one Digital MMC card in the system).

The MMC-D32 and MMC-D64 controls are stand-alone and do not reside inside the drive. The MMC-D32 can control up to 32 MMC Smart Drive Amplifiers and the MMC-D64 can control up to 64.

All Digital MMC Control models except for the MMC-D1 have standard block I/O and Ethernet capability.

Drive 1 – with Digital MMC installed

Drives 2 through 16 – no control card installed

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MMC-D64 Control
– connect up to 16
drives off each
branch

Digital MMC		
Model Number	**Description**	**Part Number**
MMC-D1	Drive-Resident Digital MMC – 1 servo axis, no block I/O, no Ethernet capability	M.1302.5101
MMC-D2	Drive-Resident Digital MMC – 2 servo axes	M.1302.5102
MMC-D4	Drive-Resident Digital MMC – 4 servo axes	M.1302.5103
MMC-D16	Drive-Resident Digital MMC – 16 servo axes	M.1302.5104
MMC-D32	Stand-Alone Digital MMC – 32 servo axes	M.1302.5109
MMC-D64	Stand-Alone Digital MMC – 64 servo axes	M.1302.5110

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2 - Select Digital MMC Control Accessories

First, determine the I/O requirements for the application. How many points are required, and of what type (e.g. digital, AC or DC, analog, etc).

All drive-resident digital MMC controls include 8 inputs (24VDC, source) and 8 outputs (24VDC, source, 250mA capacity). The D32 and D64 do not have any on-board I/O capability, but can accept up to four 32In/32Out expansion cards which mount on the side of the control. Each expansion card provides 32 inputs (24VDC, source) and 32 outputs (24VDC, source).

The I/O on each drive can also be used in the application program. There are 8 inputs (24VDC, 6 are source only, 2 are sink/source) and 4 outputs (24VDC, source, 50mA capacity) on each drive. *Example: in a 2 axis Digital MMC system you would have 24 inputs (8 on the control, 8 on each drive) and 16 outputs (8 on the control, 4 on each drive).*

Each drive has an analog input (+/-10V, 14-bit) that can be used in the application program.

If additional I/O is required, use block I/O modules. Up to 77 blocks can be connected to the Digital MMC. The blocks communicate via 4-wire twisted pair shielded cable and can be up to 200 feet apart.

The I/O on the drive-resident Digital MMC is accessible via the C5 connector.

You have two options when using the I/O on the drive-resident Digital MMC or the I/O expansion cards on the D32/D64. You can use a DIN-rail mounted breakout box with screw terminal connections and a cable to the breakout box, or you can use a flying lead cable, which connects to the Digital MMC I/O connector and has the other end unterminated. Note: on the 32In/32Out expansion card there are two high density I/O connectors (so two cables / breakout boxes are required).

The DeviceNet master, Profibus master, and Axis expansion cards can also be used on the D32 and D64. The axis expansion card can not close the loop, but allows you to read encoder feedback and change analog output values in a task.

Digital MMC I/O Connections – Drive-Resident Digital MMC		
Description	**Length**	**Part Number**
Digital MMC I/O Connector to Breakout Box Cable	1 Meter	M.1302.8254
Digital MMC I/O Connector to Breakout Box Cable	3 Meters	M.1302.8255
Digital MMC I/O Connector to Breakout Box Cable	9 Meters	M.1302.8256
Digital MMC I/O Breakout Box		M.1302.8253
Digital MMC I/O Connector to Flying Lead Cable	1 Meter	M.1302.8257
Digital MMC I/O Connector to Flying Lead Cable	3 Meters	M.1302.8258
Digital MMC I/O Connector to Flying Lead Cable	9 Meters	M.1302.8259
Digital MMC I/O Connector to Flying Lead Cable	15 Meters	M.1302.8290
Digital MMC I/O Connector to Flying Lead Cable	30 Meters	M.1302.8291

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Digital MMC I/O Connections – D32 and D64

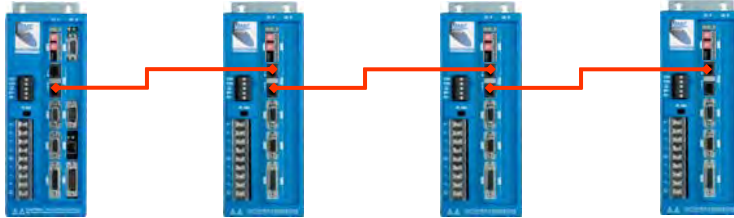| Description	Length	Part Number
32 Input / 32 Output Expansion Module		M.3000.0043
MMC Gen I/O Connector to Flying Lead	10 Feet	M.1016.2567
MMC Gen/Aux I/O Connector to Breakout Box Cable	1 Foot	M.1016.2539
MMC Gen/Aux I/O Connector to Breakout Box Cable	2 Feet	M.1016.2540
MMC Gen/Aux I/O Connector to Breakout Box Cable	3 Feet	M.1016.2541
MMC Gen I/O Breakout Box		M.1016.2532
MMC-AIO 4-1/2 Axis Analog Interface Expansion module		M.1302.5408
MMC Axis A'n' to Flying Lead Cable	10 Feet	M.1016.2519
MMC Axis A'n' to Breakout Box Cable	1 Foot	M.1016.2535
MMC Axis A'n' to Breakout Box Cable	2 Feet	M.1016.2536
MMC Axis A'n' to Breakout Box Cable	3 Feet	M.1016.2537
MMC Axis Connector Breakout Box		M.1016.2529
MMC-D DeviceNet Expansion Module		M.1017.3889
MMC-P Profibus Expansion Module		M.1300.7167

Block I/O on the drive-resident Digital MMC is accessible via the C1 connector. On the D32/D64 control, block I/O is available on the port labeled Blk IO.

If you are connecting the MMC to a G&L block I/O modules, you have two options for making the connection to the Digital MMC. You can use a DIN-rail mounted breakout box with screw terminal connections and a cable to the breakout box, or you can use a flying lead cable, which connects to the Digital MMC Block I/O connector and has the other end un-terminated. Up to 77 blocks can be used in a Digital MMC system. The blocks can be up to 200 feet apart and are connected using 4-wire shielded twisted pair wire, or if they are close together using the block i/o communications jumper.

Digital MMC Block I/O Connections

Description	Length	Part Number
Digital MMC Block I/O to Breakout Box Cable	1 Feet	M.1016.2543
Digital MMC Block I/O to Breakout Box Cable	2 Feet	M.1016.2544
Digital MMC Block I/O to Breakout Box Cable	3 Feet	M.1016.2545
Digital MMC Block I/O Breakout Box		M.1016.2533
Digital MMC Block I/O to Flying Lead Cable	10 Feet	M.1016.2568

In a multi-axis system, you will need CAT5 cables to connect the drives together and form the digital link. The drives are daisy-chained together. In a drive-resident Digital MMC system (D2,4 and 16 controls) the number of cables you will need will be one minus the number of drives in the system (e.g. a 2-axis system needs 1 cable; a 4-axis system needs 3 cables, etc.) In a stand-alone D32 or D64 system the number of cables you will need will be equal to the number of drives in the system (e.g. a 16 axis system needs 16 cables).

Digital MMC CAT5 Drive Connections		
Description	Length	Part Number
Digital MMC CAT5 Drive Connector Cable	0.3 Meters	M.1302.8285
Digital MMC CAT5 Drive Connector Cable	0.6 Meters	M.1302.8286
Digital MMC CAT5 Drive Connector Cable	1 Meter	M.1302.8287
Digital MMC CAT5 Drive Connector Cable	2 Meters	M.1302.8288
Digital MMC CAT5 Drive Connector Cable	3 Meters	M.1302.8289
Digital MMC CAT5 Drive Connector Cable	5 Meters	M.1302.8300
Digital MMC CAT5 Drive Connector Cable	10 Meters	M.1302.8301
Digital MMC CAT5 Drive Connector Cable	15 Meters	M.1302.8301
Digital MMC CAT5 Drive Connector Cable	30 Meters	M.1302.8303

All digital MMC controls have a serial port (RS-232, 422/485) for connection to an HMI.

If you are connecting the MMC to a serial device (RS-232 or RS-485) you have two options for making the connection to the Digital MMC. You can use a DIN-rail mounted breakout box with screw terminal connections and a cable to the breakout box, or you can use a flying lead cable, which connects to the Digital MMC User Port connector and has the other end unterminated.

Digital MMC User Port Connections		
Description	Length	Part Number
Digital MMC User Port to Breakout Box Cable	1 Feet	M.1016.2715
Digital MMC User Port to Breakout Box Cable	2 Feet	M.1016.2716
Digital MMC User Port to Breakout Box Cable	3 Feet	M.1016.2717
Digital MMC User Port Breakout Box		M.1016.2530
Digital MMC User Port to Flying Lead Cable	10 Feet	M.1016.2565

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3 - Select Programming and Configuration Software

PiCPro version 15 or higher is required for using the drive-resident Digital MMC and PiCPro version 16 or higher is required for the D32 and D64. The MMC-Limited Edition can be used to program all of the Digital MMC models. When software is ordered with

RS232 connection to PC

the part number listed here you will receive the newest version of software that is available. If the software is registered when it is installed, you will receive one year of free software updates. After the first year, a software maintenance contract can be purchased on a yearly basis.

MMC Smart Drive Configuration Software		
PiCPro Edition	**Description**	**Part Number**
Professional Edition	Program and Monitor all Digital MMC, PiC, MMC and MMC for PC Controls, Configure MMC Smart Drive servo amplifiers, includes cable	M.1300.7213
MMC-Limited Edition	Program and Monitor Digital MMC, MMC-A2, A4, S8 Controls, Configure MMC Smart Drive servo amplifiers, includes cable	M.1300.7214
Monitor Edition	Monitor all Digital MMC, PiC, MMC and MMC for PC Controls, Configure MMC Smart Drive servo amplifiers, includes cable, Available for free download from www.glcontrols.com	M.1300.7215

The PiCPro Programming Cable is used to interface your PC to the Digital MMC Smart Drive. *The cable is included when PiCPro is purchased.* For customers that already have PiCPro, the cable to program the Digital MMC is different than the PiCPro cable used for PiC and stand-alone MMC. *Note: the same cable is used to connect to the Digital MMC and to set up, tune and commission the drives.*

Digital MMC Smart Drive Communication Cable	
Description	**Part Number**
PiCPro Programming Cable for Digital MMC – 4 Meters	M.1302.8284

All of the manuals are available in electronic format on our website at www.glcontrols.com and are also included on the PiCPro CD and the Motion Solutions CD in electronic format. *Hardcopy manuals are not automatically included with the hardware – they will be included at no charge if requested at time of order.* When manuals are ordered with the part numbers listed here you will receive the newest version of the manual that is available.

| Manuals	
Description	**Part Number**
MMC Digital Smart Drive Hardware Manual	M.1301.5524
PiCPro Software Manual	M.1300.7592
PiCPro Function/Function Block Manual	M.1300.7591

4 - Select MMC Smart Drive and Option(s)

In a Digital MMC system, the drives are daisy-chained together using the CAT5 cables selected in the previous step. The Digital version of the drive must be used (-D or –DN in the model number).

For 230V systems, there are two versions of the drive available: a wider one that can accept the drive-resident MMC-D control card (designated by model number ending in –D) and a narrow version that cannot accept the control card. The narrow drives have the designation –DN at the end of the model number. This drive is .73" narrower than the one the MMC-D control card is installed in, saving panel space. At least one drive in a drive-resident 230V system must be the wide (-D) version. All narrow drives may be used in a D32 or D64 system.

Note: The current ratings shown are peak of sine values, not RMS. Multiply by .707 to get the RMS value.

MMC Smart Drive - 100 to 240 VAC				
Drive Model MMC-SD-	Output Power Rating (kw)	Continuous Output Current Rating (Amps)	Peak Output Current Rating (Amps)	Part Number
0.5-230-DN	0.5	2.5	7.5	M.1302.8908
1.0-230-DN	1.0	5	15.0	M.1302.8910
2.0-230-DN	2.0	10.0	30.0	M.1302.8911
0.5-230-D	0.5	2.5	7.5	M.1302.8130
1.0-230-D	1.0	5	15.0	M.1302.8131
2.0-230-D	2.0	10.0	30.0	M.1302.8132
MMC Smart Drive - 180 to 528 VAC				
Drive Model MMC-SD-	Output Power Rating (kw)	Continuous Output Current Rating (Amps)	Peak Output Current Rating (Amps)	Part Number
1.3-460-D	1.3	3	6	M.1302.8133
2.4-460-D	2.4	5.5	11	M.1302.8134
4.0-460-D	4.0	9	18	M.1302.8135
6.0-460-D	6.0	13.5	27	M.1302.8136
8.0-460-D	8.0	18	36	M.1302.8137
12.0-460-D	12.0	27.5	55	M.1302.8138
16.0-460-D	16.0	36.5	72	M.1302.8139
24.0-460-D	24.0	55	110	M.1302.8140
30.0-460-D	30.0	69.3	110	M.3000.0021
42.0-460-D	42.0	93.3	147	M.3000.0022
51.0-460-D	51.0	117.4	189	M.3000.0023
65.0-460-D	65.0	152.7	209	M.3000.0024

MMC Smart Drive Model Number

MMC-SD-24.0-460

Product Family ⎯⎯⎯⎯⎯⎯
Output Power ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
Nominal Line Voltage
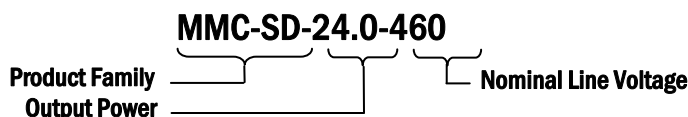
The field-installable MMC-SD-RIO is required when the Motor Feedback device is a resolver.

MMC Smart Drive Option Modules		
Option Module	Description	Part Number
MMC-SD-RIO	MMC Smart Drive Resolver Interface Option Module	M.1302.4523

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5 - Select MMC Smart Drive Accessories

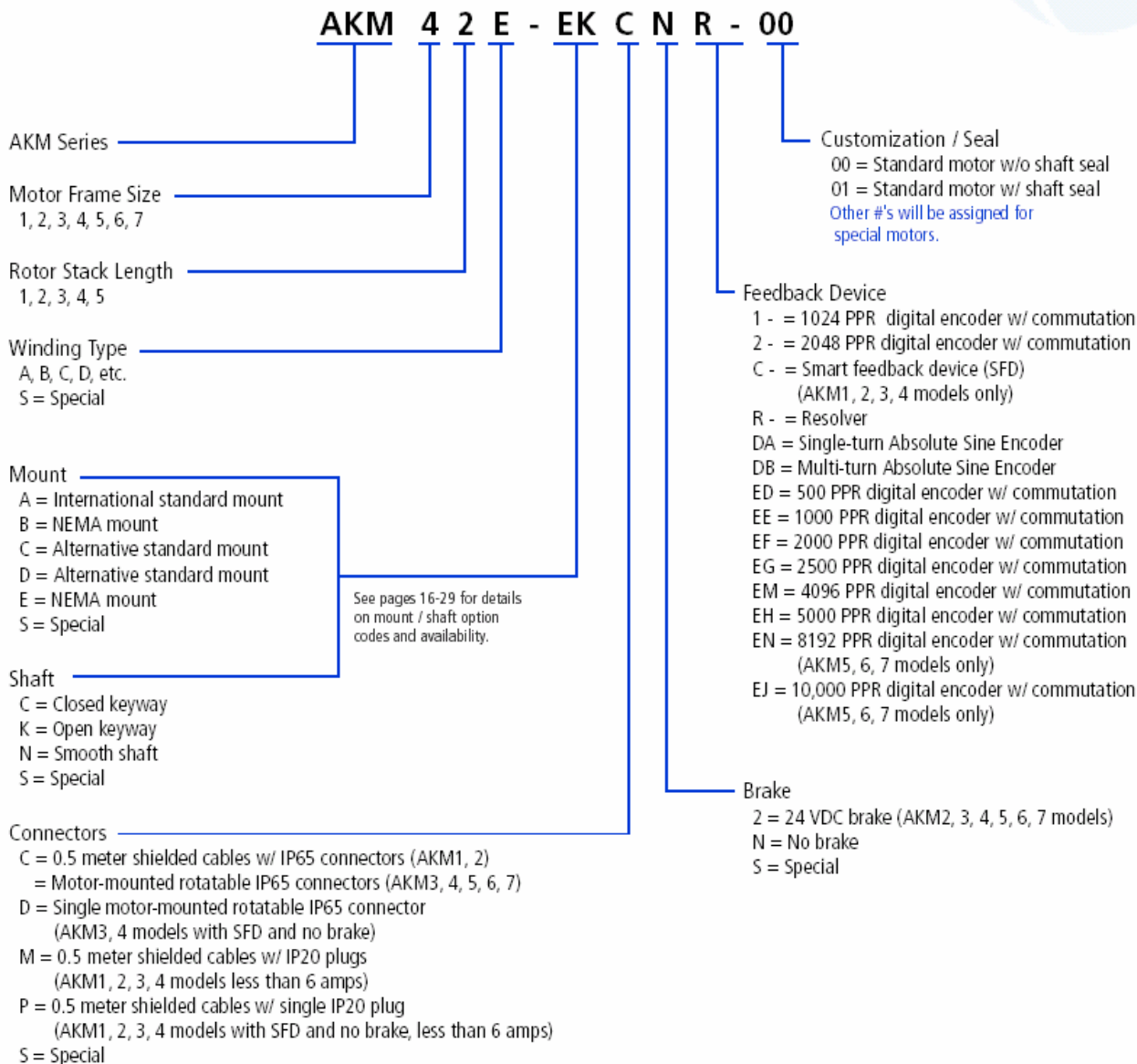Select the External Shunt as indicated by the Motion Solutions Sizing Software.

MMC Smart Drive External Shunts		
Use with MMC-SD:	**Description**	**Part Number**
MMC-SD-0.5-230 MMC-SD-1.0-230 MMC-SD-2.0-230	Dynamic Shunt for MMC-SD-x-230 300 Watt, 100 Ohm, 230 Volt	M.1015.7046
MMC-SD-1.3-460 MMC-SD-2.4-460	Shunt Resistor - 450 Watt, 130 Ohm, 820 Volts, 5.4 kW peak, 240 sec.	M.1302.7048
MMC-SD-4.0-460	Shunt Resistor - 700 Watt, 95 Ohm, 820 Volts. 8 kW peak, 250 sec.	M.1302.7049
MMC-SD-6.0-460 MMC-SD-8.0-460	Shunt Resistor - 1400 Watt, 50 Ohm, 850 Volts, 17 kW peak, 250 sec.	M.1302.7060
MMC-SD-12.0-460 MMC-SD-16.0-460	Shunt Resistor - 2800 Watt, 25 Ohm, 850 Volts, 32 kW peak, 60 sec.	M.1302.7061
MMC-SD-24.0-460	Shunt Resistor - 3900 Watt, 18 Ohm, 850 Volts, 70 kW peak, 70 sec.	M.1302.7063

An AC Line Filter is required for CE compliant installations of the MMC Smart Drive.
AC Line Reactors are required for MMC-SD-12.0-460 and larger.

MMC Smart Drive - Line Filters		
Use with MMC-SD:	**Description**	**Part Number**
MMC-SD-0.5-230 MMC-SD-1.0-230	AC Line Filter - 5 Amps; 230 Volts; 1 Phase	M.1015.6922
MMC-SD-2.0-230	AC Line Filter - 10 Amps; 230 Volts; 1 Phase	M.1015.6917
MMC-SD-1.3-460 MMC-SD-2.4-460	AC Line Filter - 7 Amps; 460 Volts; 3 Phase	M.1302.5241
MMC-SD-4.0-460 MMC-SD-6.0-460 MMC-SD-8.0-460	AC Line Filter - 16 Amps; 460 Volts; 3 Phase	M.1302.5244
MMC-SD-12.0-460 MMC-SD-16.0-460	AC Line Filter - 30 Amps; 460 Volts; 3 Phase	M.1302.5245
MMC-SD-24.0-460	AC Line Filter - 42 Amps; 460 Volts; 3 Phase	M.1302.5246
Multiple Drives	AC Line Filter - 56 Amps; 460 Volts; 3 Phase	M.1302.5247
Multiple Drives	AC Line Filter - 75 Amps; 460 Volts; 3 Phase	M.1302.5248
MMC Smart Drive - Line Reactors		
Use with MMC-SD:	**Description**	**Part Number**
MMC-SD-12.0-460	AC Line Reactor - 25 Amps; 460 Volts; 3 Phase	M.1302.7373
MMC-SD-16.0-460	AC Line Reactor - 35 Amps; 460 Volts; 3 Phase	M.1302.7374
MMC-SD-24.0-460	AC Line Reactor - 45 Amps; 460 Volts; 3 Phase	M.1302.7375
MMC-SD-30.0-460	AC Line Reactor – 55 Amps; 460 Volts; 3 Phase	M.3000.0105
MMC-SD-42.0-460	AC Line Reactor – 80 Amps; 460 Volts; 3 Phase	M.3000.0106
MMC-SD-51.0-460	AC Line Reactor – 100 Amps; 460 Volts; 3 Phase	M.3000.0107
MMC-SD-65.0-460	AC Line Reactor – 130 Amps; 460 Volts; 3 Phase	M.3000.0108

6 - Select Servo Motor - AKM Motors

AKM Series Brushless Servomotors

AKM 4 2 E - EK C N R - 00

AKM Series

Motor Frame Size
1, 2, 3, 4, 5, 6, 7

Rotor Stack Length
1, 2, 3, 4, 5

Winding Type
A, B, C, D, etc.
S = Special

Mount
A = International standard mount
B = NEMA mount
C = Alternative standard mount
D = Alternative standard mount
E = NEMA mount
S = Special

See pages 16-29 for details on mount / shaft option codes and availability.

Shaft
C = Closed keyway
K = Open keyway
N = Smooth shaft
S = Special

Connectors
C = 0.5 meter shielded cables w/ IP65 connectors (AKM1, 2)
 = Motor-mounted rotatable IP65 connectors (AKM3, 4, 5, 6, 7)
D = Single motor-mounted rotatable IP65 connector
 (AKM3, 4 models with SFD and no brake)
M = 0.5 meter shielded cables w/ IP20 plugs
 (AKM1, 2, 3, 4 models less than 6 amps)
P = 0.5 meter shielded cables w/ single IP20 plug
 (AKM1, 2, 3, 4 models with SFD and no brake, less than 6 amps)
S = Special

Customization / Seal
00 = Standard motor w/o shaft seal
01 = Standard motor w/ shaft seal
Other #'s will be assigned for special motors.

Feedback Device
1 - = 1024 PPR digital encoder w/ commutation
2 - = 2048 PPR digital encoder w/ commutation
C - = Smart feedback device (SFD) (AKM1, 2, 3, 4 models only)
R - = Resolver
DA = Single-turn Absolute Sine Encoder
DB = Multi-turn Absolute Sine Encoder
ED = 500 PPR digital encoder w/ commutation
EE = 1000 PPR digital encoder w/ commutation
EF = 2000 PPR digital encoder w/ commutation
EG = 2500 PPR digital encoder w/ commutation
EM = 4096 PPR digital encoder w/ commutation
EH = 5000 PPR digital encoder w/ commutation
EN = 8192 PPR digital encoder w/ commutation (AKM5, 6, 7 models only)
EJ = 10,000 PPR digital encoder w/ commutation (AKM5, 6, 7 models only)

Brake
2 = 24 VDC brake (AKM2, 3, 4, 5, 6, 7 models)
N = No brake
S = Special

AKM Motors are ordered using the standard AKM Part Number.

IMPORTANT: The only AKM feedback devices supported by the Digital MMC are as follows:
- '2' (2048 PPR encoder)
- 'R' (Resolver which requires the MMC-SD-RIO resolver card to be installed in the MMC Smart Drive as described in Section 4)
- 'DA' (Single-turn Absolute Sine Encoder)
- 'DB' (Multi-turn Absolute Sine Encoder)

The cables supplied by G&L Motion Control are for the 'C' connector option.

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6 - Select Servo Motor – Goldline DDR Motors

DH 08 1 M - 1 2 - 1 3 1 0 - xxx

Direct Drive Series
D = 115/230 VAC winding
DH = 400/480 VAC winding

Motor Frame Size
06 = 6.93" O.D.
08 = 8.60" O.D.
10 = 11.19" O.D.
14 = 14.25" O.D.

Rotor Stack Length
1 = Short stack
2 = Mid stack
3 = Long stack

Winding Type
A = Std. w/ resolver [1]
M = Std. w/ sine encoder

Mounting Option
1 = Face mount
2 = Flange mount

Designated for Specials

Unit Seal
0 = Non-sealed unit
5 = IP65 [2]
4 = IP67 [2]

Bearing Option
1 = Single bearing design
2 = Dual bearing design [3]

Feedback Device
2 = Resolver ("A" Winding Type)
3 = Sine Encoder ("M" Winding Type)

Shaft Option
1= Straight thru bore w/ face coupling

Connector Type
2 = Straight
3 = 90°, rotatable

Notes:
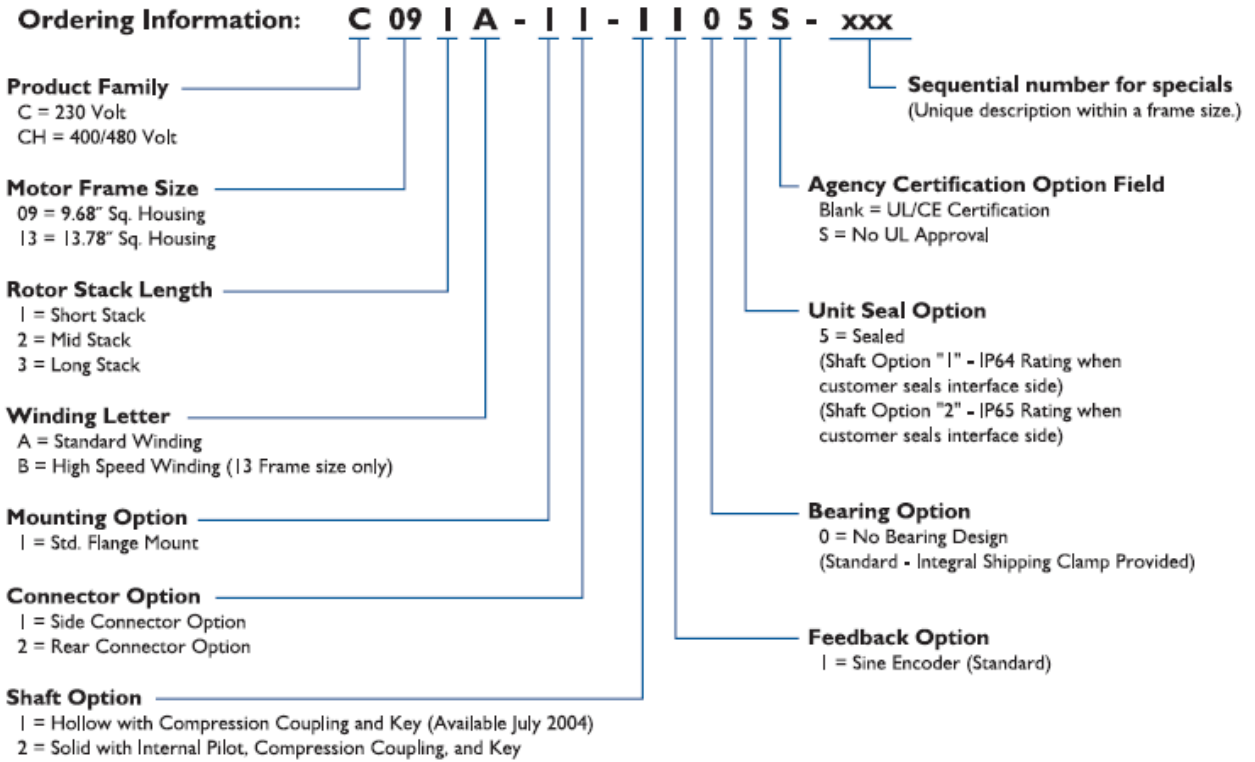[1] All models except D14x & DH14x. [2] Resolver models only. [3] Standard on D143 & DH143 models.

Goldline DDR Motors are ordered using the standard DDR Part Number.

IMPORTANT: The only feedback type supported on Goldline DDR Motors with MMC Smart Drives is sine encoder feedback

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6 - Select Servo Motor – Cartridge DDR Motors

CARTRIDGE DDR™

Ordering Information: C 09 1 A - 1 1 - 1 1 0 5 S - xxx

Product Family
C = 230 Volt
CH = 400/480 Volt

Motor Frame Size
09 = 9.68" Sq. Housing
13 = 13.78" Sq. Housing

Rotor Stack Length
1 = Short Stack
2 = Mid Stack
3 = Long Stack

Winding Letter
A = Standard Winding
B = High Speed Winding (13 Frame size only)

Mounting Option
1 = Std. Flange Mount

Connector Option
1 = Side Connector Option
2 = Rear Connector Option

Shaft Option
1 = Hollow with Compression Coupling and Key (Available July 2004)
2 = Solid with Internal Pilot, Compression Coupling, and Key

Sequential number for specials
(Unique description within a frame size.)

Agency Certification Option Field
Blank = UL/CE Certification
S = No UL Approval

Unit Seal Option
5 = Sealed
(Shaft Option "1" - IP64 Rating when
customer seals interface side)
(Shaft Option "2" - IP65 Rating when
customer seals interface side)

Bearing Option
0 = No Bearing Design
(Standard - Integral Shipping Clamp Provided)

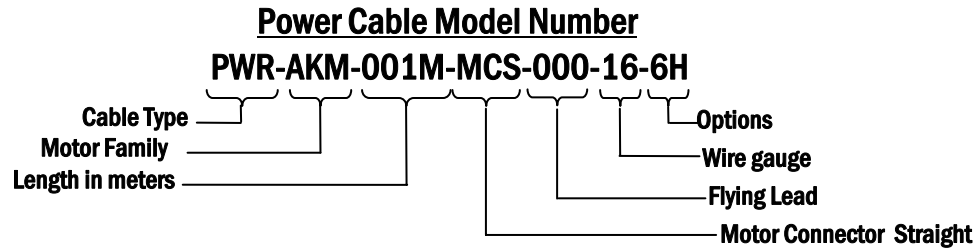**Feedback Option**
1 = Sine Encoder (Standard)

Cartridge DDR Motors are ordered using the standard Cartridge DDR Part Number.

IMPORTANT: The only feedback type supported on Cartridge DDR Motors with MMC Smart Drives is sine encoder feedback.

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7 - Select Motor Power Interface

The same Motor Power cables are used for AKM, Goldline DDR and Cartridge DDR motors. The wire gauge is included in the part number for the motor power cable. Use the following table to determine which gauge is required for the motor you are using.

Power Cable Model Number
PWR-AKM-001M-MCS-000-16-6H

- Cable Type
- Motor Family
- Length in meters
- Options
- Wire gauge
- Flying Lead
- Motor Connector Straight

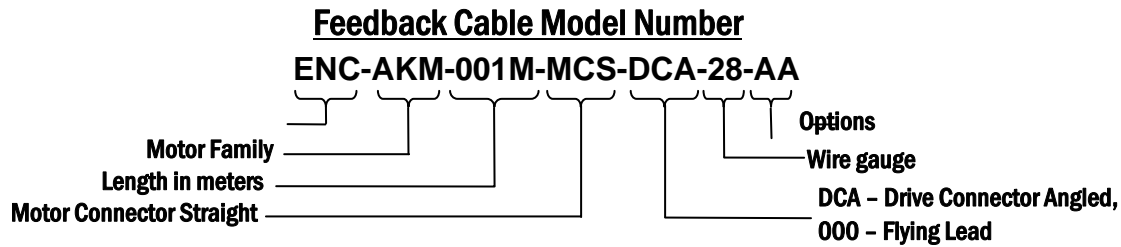| AKM Motor Power Cables – Flex Rated		
Description	**Length**	**Part Number**
PWR-AKM-1.0M-MCS-000-16-6H	1 Meter	M.1302.8580
PWR-AKM-3.0M-MCS-000-16-6H	3 Meters	M.1302.8545
PWR-AKM-6.0M-MCS-000-16-6H	6 Meters	M.1302.8581
PWR-AKM-9.0M-MCS-000-16-6H	9 Meters	M.1302.8553
PWR-AKM-15M-MCS-000-16-6H	15 Meters	M.1302.8583
PWR-AKM-30M-MCS-000-16-6H	30 Meters	M.1302.8584
PWR-AKM-1.0M-MCS-000-14-6H	1 Meter	M.1302.8585
PWR-AKM-3.0M-MCS-000-14-6H	3 Meters	M.1302.8549
PWR-AKM-6.0M-MCS-000-14-6H	6 Meters	M.1302.8586
PWR-AKM-9.0M-MCS-000-14-6H	9 Meters	M.1302.8554
PWR-AKM-15M-MCS-000-14-6H	15 Meters	M.1302.8588
PWR-AKM-30M-MCS-000-14-6H	30 Meters	M.1302.8589
PWR-AKM-1.0M-MCS-000-12-6H	1 Meter	M.1302.8759
PWR-AKM-3.0M-MCS-000-12-6H	3 Meters	M.1302.8760
PWR-AKM-6.0M-MCS-000-12-6H	6 Meters	M.1302.8761
PWR-AKM-9.0M-MCS-000-12-6H	9 Meters	M.1302.8762
PWR-AKM-15M-MCS-000-12-6H	15 Meters	M.1302.8763
PWR-AKM-30M-MCS-000-12-6H	30 Meters	M.1302.8764

Motor	Rated Power (Watts)	Continuous Current (stall)	Power Cable (AWG)
Goldline DDR DH102 and smaller			14
Goldline DDR DH103 and larger			12
AKM11B (240 V)	140	1.1 amps	16
AKM11C (120 V)	111	1.5 amps	16
AKM12C (240 V)	234	1.5 amps	16
AKM12E (120 V)	234	2.7 amps	16
AKM13C (240 V)	290	1.5 amps	16
AKM13D (120 V)	268	2.4 amps	16
AKM21C (240 V)	324	1.6 amps	16
AKM21E (120 V)	303	3.1 amps	16
AKM22C (480 V)	567	1.4 amps	16
AKM22E (240 V)	586	2.8 amps	16
AKM22G (120 V)	539	4.8 amps	16
AKM23C (480 V)	696	1.4 amps	16
AKM23D (480 V)	771	2.2 amps	16
AKM23F (240 V)	787	4.3 amps	16
AKM24C (480 V)	703	1.4 amps	16
AKM24D (480 V)	930	2.2 amps	16
AKM24F (240 V)	938	3.9 amps	16
AKM31C (480 V)	572	1.3 amps	16
AKM31E (240 V)	597	3.0 amps	16
AKM31H (120 V)	609	5.9 amps	16
AKM32C (480 V)	671	1.4 amps	16
AKM32D (480 V)	993	2.3 amps	16
AKM32H (240 V)	1063	5.5 amps	16
AKM33C (480 V)	654	1.5 amps	16
AKM33E (480 V)	1189	2.5 amps	16
AKM33H (240 V)	1307	5.6 amps	16
AKM41C (480 V)	638	1.5 amps	16
AKM41E (480 V)	993	2.8 amps	16
AKM41H (240 V)	1018	5.6 amps	16
AKM42C (480 V)	633	1.4 amps	16
AKM42E (480 V)	1139	2.8 amps	16
AKM42G (480 V)	1477	4.8 amps	16
AKM42J (240 V)	1495	8.4 amps	14
AKM43E (480 V)	1181	2.8 amps	16
AKM43G (480 V)	1615	4.9 amps	16
AKM43K (240 V)	1646	9.6 amps	14
AKM44E (480 V)	1194	2.9 amps	16
AKM44G (480 V)	1670	5.0 amps	16
AKM44J (480 V)	1728	8.8 amps	14
AKM51E (480 V)	1194	2.8 amps	16
AKM51G (400 V)	1372	4.8 amps	16
AKM51K (240 V)	1354	9.4 amps	14
AKM52E (480 V)	1525	3.0 amps	16

AKM52G (480 V)	2092	4.7 amps	16
AKM52K (400 V)	2246	9.3 amps	14
AKM52M (240 V)	2450	13.1 amps	14
AKM53G (480 V)	2388	4.7 amps	16
AKM53K (480 V)	3228	9.4 amps	14
AKM53M (240 V)	2739	13.4 amps	14
AKM53P (240 V)	3079	19.1 amps	12
AKM54G (480 V)	2576	5.0 amps	16
AKM54K (480 V)	3875	9.7 amps	14
AKM54L (400 V)	3831	12.5 amps	14
AKM54N (240 V)	3610	17.8 amps	12
AKM62G (480 V)	2136	4.9 amps	16
AKM62K (480 V)	3770	9.6 amps	14
AKM62M (480 V)	3581	13.4 amps	14
AKM62P (240 V)	3817	18.8 amps	12
AKM63G (480 V)	2293	4.5 amps	16
AKM63K (480 V)	4398	9.9 amps	14
AKM63M (480 V)	4948	13.8 amps	14
AKM63N (400 V)	5027	17.4 amps	12
AKM64K (480 V)	4267	9.2 amps	14
AKM64L (480 V)	5278	12.8 amps	14
AKM64P (400 V)	5608	18.6 amps	12
AKM65K (480 V)	4539	9.8 amps	14
AKM65M (480 V)	5686	13.6 amps	14
AKM65N (480 V)	6158	17.8 amps	12
AKM72K (480 V)	4524	9.3 amps	14
AKM72M (480 V)	5786	13.0 amps	14
AKM72P (480 V)	6671	18.7 amps	12
AKM73M (480 V)	6051	13.6 amps	14
AKM73P (480 V)	7712	19.5 amps	12
AKM74L (480 V)	6084	12.9 amps	14
AKM74P (480 V)	7519	18.5 amps	12

8 - Select Motor Feedback Interface

Use ENC type cables for incremental encoder feedback, ENDAT type cables for single and multi-turn absolute encoder feedback, and RESV type cables for resolver feedback AKM motors.

Each amplifier in the system has two feedback ports, F1 and F2. One port (usually F1) is used for the feedback for the motor. The other port can be used for a read-only digitizing axis (master axis). The feedback is read through the digital link back into the control.

Feedback Cable Model Number
ENC-AKM-001M-MCS-DCA-28-AA

Motor Family
Length in meters
Motor Connector Straight

Options
Wire gauge
DCA – Drive Connector Angled,
000 – Flying Lead

AKM Motor Feedback Cables – Static		
Description	**Length**	**Part Number**
ENC-AKM-1.0M-MCS-DCA-28-NA	1 Meter	M.1302.8590
ENC-AKM-3.0M-MCS-DCA-28-NA	3 Meters	M.1302.8447
ENC-AKM-6.0M-MCS-DCA-28-NA	6 Meters	M.1302.8591
ENC-AKM-9.0M-MCS-DCA-28-NA	9 Meters	M.1302.8542
ENC-AKM-15M-MCS-DCA-28-NA	15 Meters	M.1302.8594
ENC-AKM-30M-MCS-DCA-28-NA	30 Meters	M.1302.8595
ENDAT-AKM-1.0M-MCS-DCA-28-NA	1 Meter	M.1302.8605
ENDAT-AKM-3.0M-MCS-DCA-28-NA	3 Meters	M.1302.8437
ENDAT-AKM-6.0M-MCS-DCA-28-NA	6 Meters	M.1302.8606
ENDAT-AKM-9.0M-MCS-DCA-28-NA	9 Meters	M.1302.8607
ENDAT-AKM-15M-MCS-DCA-28-NA	15 Meters	M.1302.8608
ENDAT-AKM-30M-MCS-DCA-28-NA	30 Meters	M.1302.8609
RESV-AKM-1.0M-MCS-DCA-28-NA	1 Meter	M.1302.8618
RESV-AKM-3.0M-MCS-DCA-28-NA	3 Meters	M.1302.8439
RESV-AKM-6.0M-MCS-DCA-28-NA	6 Meters	M.1302.8619
RESV-AKM-9.0M-MCS-DCA-28-NA	9 Meters	M.1302.8620
RESV-AKM-15M-MCS-DCA-28-NA	15 Meters	M.1302.8621
RESV-AKM-30M-MCS-DCA-28-NA	30 Meters	M.1302.8622

AKM Motor Feedback Cables – Flex Rated

Description	Length	Part Number
ENC-AKM-1.0M-MCS-DCA-28-AA	1 Meter	M.1302.8600
ENC-AKM-3.0M-MCS-DCA-28-AA	3 Meters	M.1302.8435
ENC-AKM-6.0M-MCS-DCA-28-AA	6 Meters	M.1302.8601
ENC-AKM-9.0M-MCS-DCA-28-AA	9 Meters	M.1302.8602
ENC-AKM-15M-MCS-DCA-28-AA	15 Meters	M.1302.8603
ENC-AKM-30M-MCS-DCA-28-AA	30 Meters	M.1302.8604
ENDAT-AKM-1.0M-MCS-DCA-28-AA	1 Meter	M.1302.8613
ENDAT-AKM-3.0M-MCS-DCA-28-AA	3 Meters	M.1302.8438
ENDAT-AKM-6.0M-MCS-DCA-28-AA	6 Meters	M.1302.8614
ENDAT-AKM-9.0M-MCS-DCA-28-AA	9 Meters	M.1302.8615
ENDAT-AKM-15M-MCS-DCA-28-AA	15 Meters	M.1302.8616
ENDAT-AKM-30M-MCS-DCA-28-AA	30 Meters	M.1302.8617
RESV-AKM-1.0M-MCS-DCA-28-AA	1 Meter	M.1302.8630
RESV-AKM-3.0M-MCS-DCA-28-AA	3 Meters	M.1302.8450
RESV-AKM-6.0M-MCS-DCA-28-AA	6 Meters	M.1302.8631
RESV-AKM-9.0M-MCS-DCA-28-AA	9 Meters	M.1302.8632
RESV-AKM-15M-MCS-DCA-28-AA	15 Meters	M.1302.8633
RESV-AKM-30M-MCS-DCA-28-AA	30 Meters	M.1302.8634

8 - Select Motor Feedback Interface (continued)

If a flying lead Motor Feedback cable is used then select a drive or panel mount breakout to simplify wiring by providing screw terminations for the cable.

If you are using the F2 connector to connect to an external encoder (for example to read the feedback of an uncontrolled master axis), you have two options to wire the F2 connector. You can use a drive-mounted breakout board with screw terminal connections (which mounts directly on the drive's F2 connector), or you can use a DIN-rail mounted breakout box with screw terminal connections and a cable to the breakout box (this is available as individual components or as a kit which includes both the cable and the breakout box).

MMC Smart Drive - Drive F1/F2 Connector Breakout, Drive Mounted

Description				Part Number
Drive Mounted Drive F1/F2 Connector Breakout Board				M.1302.6970

MMC Smart Drive - Drive F1/F2 Connector Breakout, Panel Mounted

Cable Description	Length in meters			
	1	3	9	15
Drive F1/F2 Panel Mount Breakout Kit	M.1302.7005	M.1302.7006	M.1302.7007	M.1302.7008	
Drive F1/F2 Panel Mount Breakout Board Cable	M.1302.6976	M.1302.6977	M.1302.6979	M.1302.6980	
Drive F1/F2 Panel Mount Breakout Box					M.1302.6972

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www.electromate.com
sales@electromate.com

9 - Select Drive I/O Interface

You have several options when wiring the I/O on the MMC Smart Drive. You can use a drive-mounted breakout board with screw terminal connections (which mounts directly on the drive I/O connector), you can use a DIN-rail mounted breakout box with screw terminal connections and a cable to the breakout box (this is available as individual components or as a kit which includes both the cable and the breakout box), or you can use a flying lead cable, which connects to the MMC Smart Drive I/O connector and has the other end un-terminated.

MMC Smart Drive - Drive I/O Connector Breakout, Drive Mounted					
Description					Part Number
Drive Mounted Drive I/O Connector Breakout Board					M.1302.6971
MMC Smart Drive - Drive I/O Connector Breakout, Panel Mounted					
Cable Description	Length in meters				
	1	3	9		
Drive I/O Panel Mount Breakout Kit	M.1302.7009	M.1302.7030	M.1302.7031		
Dirve I/O Panel Mount Breakout Board Cable	M.1302.6982	M.1302.6984	M.1302.6985		
Drive I/O Panel Mount Breakout Box					M.1302.6973
MMC Smart Drive - Drive I/O Connector to Flying Lead					
Cable Description	Length in meters				
	1	3	9	15	30
Drive I/O Connector to Flying Lead Cable	M.1302.7032	M.1302.7034	M.1302.7035	M.1302.7036	M.1302.7037