

TJ1-

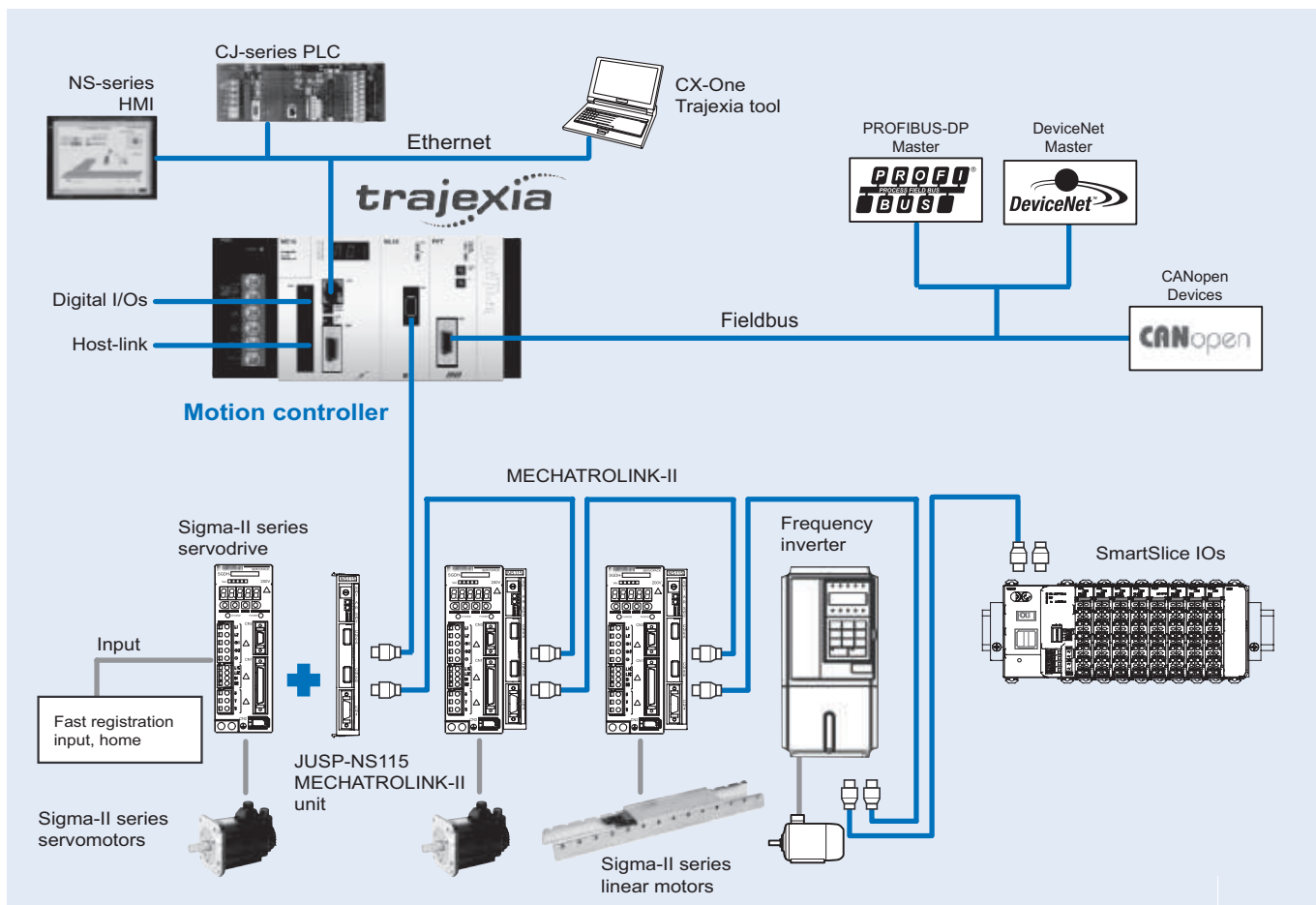
# Trajexia Motion Controller

## Stand-Alone Advanced Motion Controller Using MECHATROLINK-II Motion Bus

- 16 axes advanced motion coordination over a robust and fast motion link: MECHATROLINK-II
- Supports position, speed and torque control
- Each axis can run complex interpolated moves, e-cams and e-gearboxes
- Advanced debugging tools including trace and oscilloscope functions
- Hardware registration input for each servo axis
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 14 tasks simultaneously
- Open communication - Ethernet built-in, PROFIBUS-DP, DeviceNet and CANopen as options



## System Configuration



Specifications

Trajexia General Specifications

Item	Details
Model	TJ1-□
Ambient operating temperature	0 to 55°C
Ambient operating humidity	10 to 90%RH
Ambient storage temperature	-20 to 70°C
Ambient storage humidity	90% max. (with no condensation)
Atmosphere	No corrosive gases
Vibration resistance	10 to 57 Hz: (0.075 mm amplitude) 57 to 100 Hz Acceleration: 9.8 m/s <sup>2</sup> , in X, Y and Z directions for 80 minutes.
Shock resistance	143 m/s <sup>2</sup> , 3 times each X, Y and Z directions.
Insulation resistance	20 MOhm
Dielectric strength	500 Volt
Protective structure	IP20
International standards	CE, EN 61131-2, cULus, Lloyds (cULus approval pending for TJ1-MC04 and TJ1-ML04) RoHS compliant

Trajexia Motion Control Units

Item	Details		
Model	TJ1-MC16 TJ1-MC04		
Number of axes	16 4 (+1 using TJ1-FL02 unit)		
Number of inverters and I/O modules	8 maximum (Inverters in speed or torque mode)		
Number of MECHATROLINK-II master units	Up to 4 MECHATROLINK-II master units (see below TJ1-ML16/ML04) can be connected		
Cycle time	Selectable 0.5 ms, 1 ms or 2 ms		
Programming language	BASIC-like Motion language		
Multi-tasking	Up to 14 tasks running simultaneously		
Built-in Digital I/O	16 Inputs and 8 Outputs, for general purpose		
Measurement units	User definable		
Available memory for user programs	500KB		
Data storage capacity	Up to 2 MB flash data storage		
Saving program data, motion controller	SRAM with battery backup and Flash-ROM		
Saving program data, personal computer	Trajexia Motion Perfect software manages a backup on the hard disk of the personal computer.		
Communication ports	1 Ethernet port and 2 serial ports		
Firmware update	Via Trajexia software tool		
Ethernet port	Electrical characteristics	Conform to IEEE 802.3 (100BaseT)	
	Connector	RJ45 Ethernet connector	
Serial port	Electrical characteristics	Conform 1 port to RS232C and 1 port to RS485/RS422A (selectable by switch)	
	Connector	SUB-D9 connector (Counterpart included in the package)	
	Synchronization	Start-stop synchronization (asynchronous)	
	Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 bps	
	Transmission format	Databit Length	7 or 8 bit
		Stop Bit	1 or 2 bit
		Parity Bit	Even/Odd/None
	Transmission mode	Point-to-multipoint (1:N)	
	Transmission protocol	RS-232C (1:1)	Host Link master protocol, Host Link slave protocol, ASCII general-purpose
		RS-422A (1:N)	Host Link master protocol, Host Link slave protocol, ASCII general-purpose
		RS-485 (1:N)	ASCII general-purpose
	Galvanic isolation	RS422A port	
Communication buffers	254 bytes		
Flow control	None		
Terminator	Yes, selectable by switch		
Cable length	15 m for RS232 and 500 meter for RS422/485		

Trajexia MECHATROLINK-II Master Units

Item	Specifications	
Model	TJ1-ML16 TJ1-ML04	
Controlled devices with MECHATROLINK-II interface	Junma MLII, Sigma-2 and Sigma-3 Servo drives, SmartSlice IOs, other I/O units and V7, F7 and G7 Frequency inverters	
Electrical characteristics	Conforms to MECHATROLINK standard	
Communication ports	1 MECHATROLINK-II master	
Transmission speed	10Mbps	
Communication cycle	0.5 ms, 1ms or 2ms	
Stations slave types	Axes or Servo drives	
	Frequency inverters	
	I/O Modules	
Number of stations per master / Cycle time	Max.16 Stations / 2ms	Max.4 Stations / 2ms
	Max.8 Stations / 1ms	Max.4 Stations / 1ms
	Max.4 Stations / 0.5 ms (Only Sigma-3 drives)	Max.4 Stations / 0.5 ms (Only Sigma-3 drives )
Transmission distance	Max.50 meters without using repeater	

### Trajexia PROFIBUS Slave Unit

Items	Specifications
Model	TJ1-PRT
PROFIBUS standard	Conforms to PROFIBUS-DP standard EN50170 (DP-V0)
Communication ports	1 PROFIBUS-DP Slave
Transmission speed	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000 and 12000 kbps
Node numbers	0 to 99
I/O size	0 to 120 words (16bit), configurable, for both directions
Galvanic isolation	Yes

### Trajexia DeviceNet Slave Unit

Items	Specifications
Model	TJ1-DRT
PROFIBUS standard	Conforms to DeviceNet standard of CIP edition 1
Communication ports	1 DeviceNet Slave
Transmission speed	125, 250 and 500 Kbps, auto-detect
Node numbers	0 to 63
I/O size	0 to 32 words (16bit), configurable, for both directions
Galvanic isolation	Yes

### Trajexia CANopen Unit

Items	Specifications
Model	TJ1-CORT
Electrical Characteristics	Conforms to CAN 2.0 B
Communication ports	1 CANopen
Transmission speed	20, 50, 125 and 500 Kbps
Implemented CiA Standards	DS301, DS302
PDO Support	8 TPDO and 8 RPDO
PDO Mapping	Each PDO can be mapped into TJ1-MC16/04 VR, Table, Analogue and digital IO. BASIC commands assign mapping and start address (*)
CANopen slave configuration	Any SDO message can be sent using BASIC during start-up and operation
CANopen network states	CANopen network can be set to Pre-operational and Operational using BASIC
CANopen slave emergencies	Available using BASIC command
Galvanic isolation	Yes

**Note:** (\*) TJ1-MC16/04 CPUs support a total of 256 digital IO points and 36 Analogue IO points.

### Trajexia Flexible Axis Unit

Items	Specifications	
Model	TJ1-FL02	
Number of axes	2	
Control method	±10V Analogue Output in closed loop or pulse train output in open loop	
Encoder	Position/speed Feedback	2 Incremental and Absolute encoders
	Absolute encoder standards supported	SSI 200 kHz, EnDat 1 MHz and Tamagawa
	Encoder Input maximum frequency	6 MHz
	Encoder/Pulse Output max. frequency	2 MHz
Auxiliary I/Os	2 Fast registration Inputs, 2 definable inputs, 2 Enable output, 4 position switch outputs or axes reset	
Galvanic isolation	Yes	

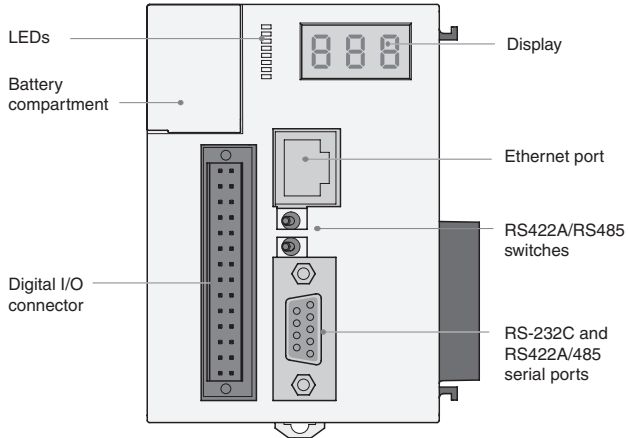
### SmartSlice MECHATROLINK-II Interface Unit

Item	Specifications
Model	GRT1-ML2
Electrical characteristics	Conform to MECHATROLINK standard
Communication cycle	0.5, 1 or 2 ms
Power supply	24Vdc
Number of connectable Slices	Up to 64 slices with a maximum amount of 128 bytes (*)
IO mapping	Automatic analogue and digital IO mapping into TJ1-MC16/04 CPU
Slice unit configuration	Not supported
Supported slice units	See ordering information section

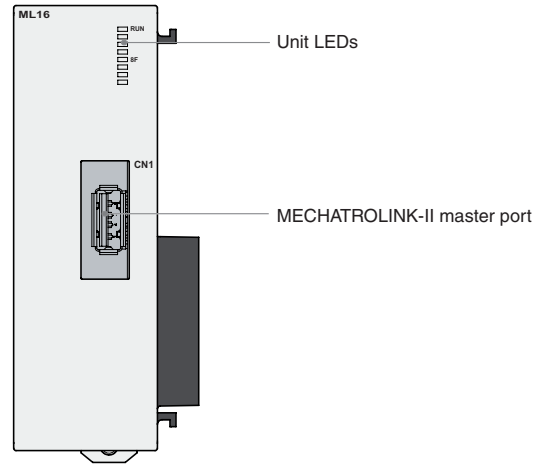
**Note:** (\*) TJ1-MC16/04 CPUs support a total of 256 digital IO points and 36 Analogue IO points.

Nomenclature

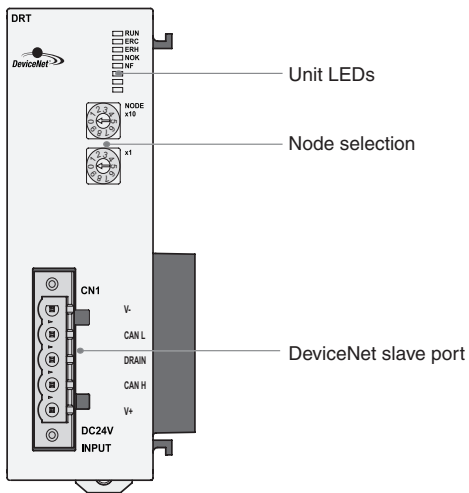
Trajexia Motion Controller Unit - TJ1-MC16/04



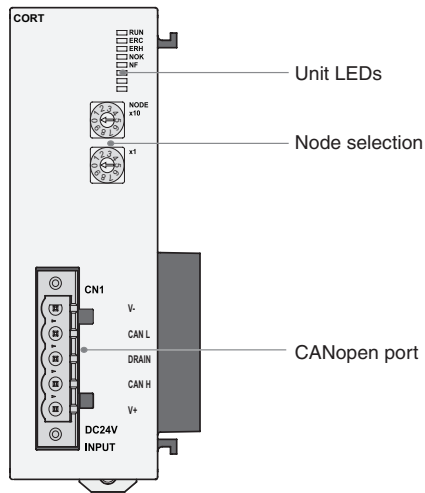
Trajexia MECHATROLINK-II Master Unit - TJ1-ML16/04



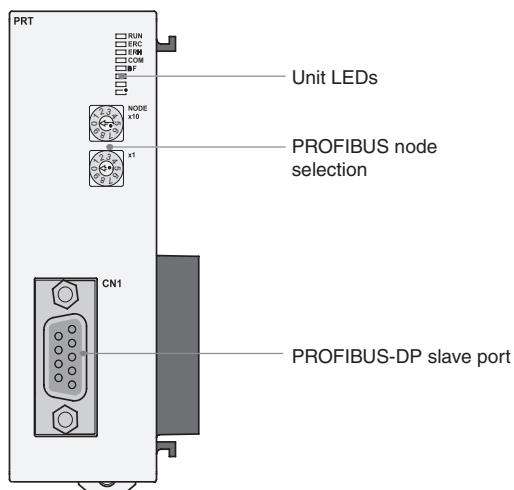
Trajexia DeviceNet Slave Unit - TJ1-DRT



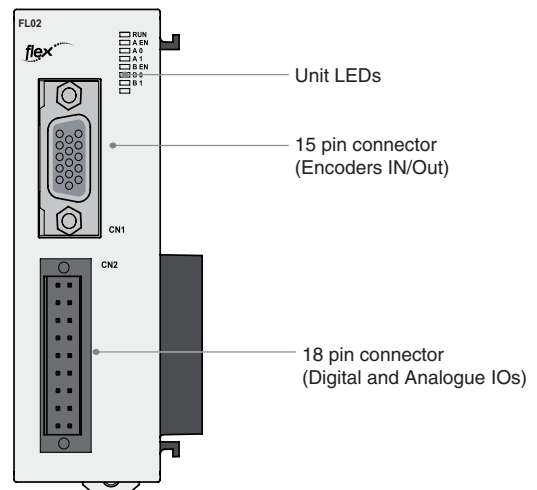
Trajexia CANopen Unit - TJ1-CORT



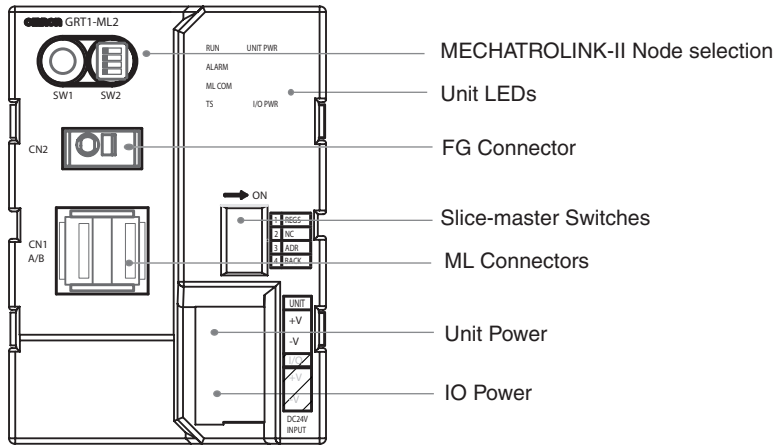
Trajexia PROFIBUS-DP Unit - TJ1-PRT



Trajexia Flex Axis Unit - TJ1-FL02



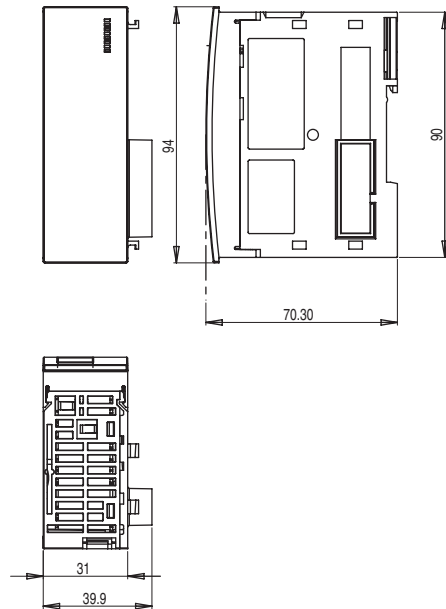
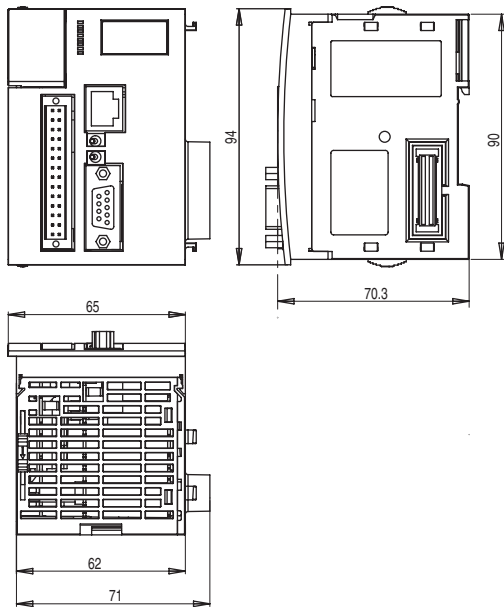
SmartSlice MECHATROLINK-II Interface Unit - GRT1-ML2



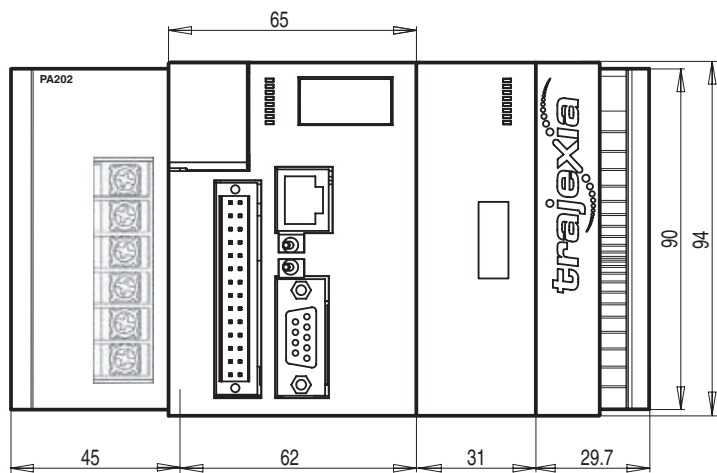
Dimensions

Trajexia Motion Controller - TJ1-MC16/04

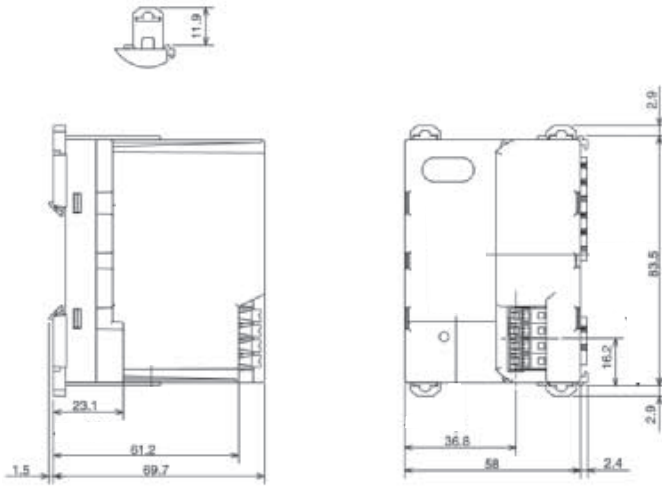
Trajexia Modules - TJ1-ML16/04, -PRT, -DRT, -CORT, -FL02



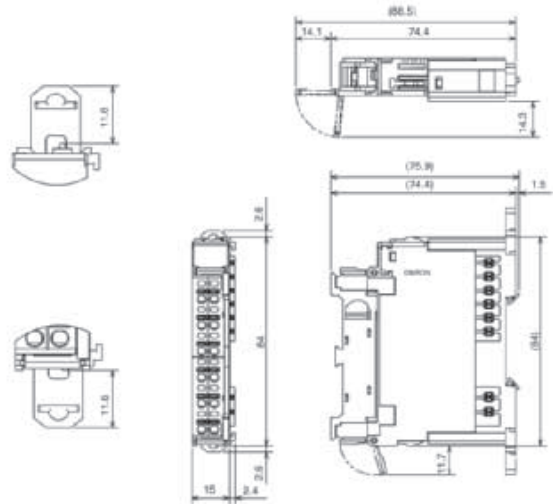
Trajexia System - CJ1W-PA202 + TJ1-MC16 + One Module + TJ1-TER



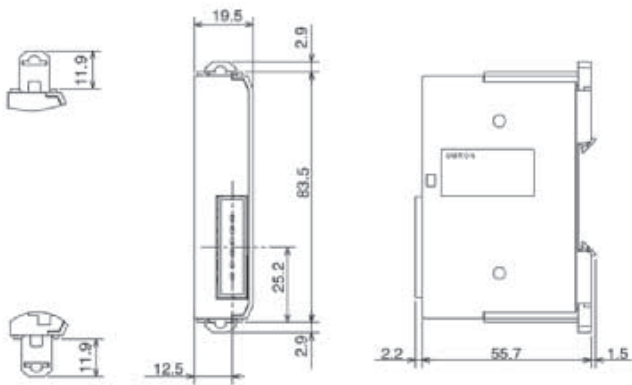
## SmartSlice Communication unit - GRT1-ML2



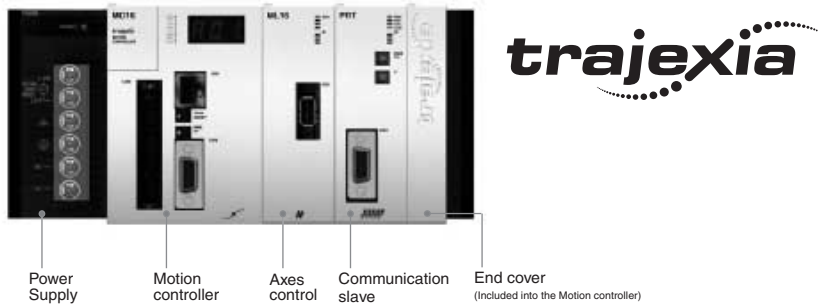
## SmartSlice I/O units - GRT1\_



## SmartSlice End unit - GRT1-END



Ordering Information



Trajexia motion controller

Name	Model
Trajexia Motion Controller Unit, up to 4 axes. (Trajexia end cover unit TJ1-TER is included)	TJ1-MC04
Trajexia Motion Controller Unit, up to 16 axes. (Trajexia end cover unit TJ1-TER is included)	TJ1-MC16
Power Supply for Trajexia system, 100-240V AC	CJ1W-PA202
Power Supply for Trajexia system, 24V DC	CJ1W-PD022

Trajexia - Axes control modules

Name	Model
Trajexia MECHATROLINK-II Master Unit (up to 4 stations)	TJ1-ML04
Trajexia MECHATROLINK-II Master Unit (up to 16 stations)	TJ1-ML16
Trajexia Flexible Axis Unit (for 2 Axes)	TJ1-FL02

Trajexia - Communication modules

Name	Model
Trajexia DevicNet slave unit	TJ1-DRT
Trajexia PROFIBUS-DP slave unit	TJ1-PRT
Trajexia CANopen unit	TJ1-CORT

MECHATROLINK-II - Related devices

Servo System & Frequency Inverters

Name	Remarks	Model
MECHATROLINK-II interface unit for Servos and Inverters	For Sigma-II series Servo drives. (Firmware version 39 or later)	JUSP-NS115
	Junma servo drives with MECHATROLINK-II port built-in the drive	SJDE-□□ANA-OY
	For Varispeed V1000 Inverter. Release by 2008 (For Inverter's version supported contact your Omron sales office)	SI-T3
	For Varispeed V7 Inverter (For Inverter's version supported contact your Omron sales office)	SI-TV7
	For Varispeed F7, G7 Inverter (For Inverter's version supported contact your Omron sales office)	SI-T

Note: Refer to Motion & Drives catalogue for detailed specs and ordering information

SmartSlice IOs system

Function	Specification	Model
SmartSlice Interface unit	SmartSlice MECHATROLINK-II interface unit	GRT1-ML2
End plate, one unit required per bus interface		GRT1-END
4 NPN inputs	24 V DC, 6 mA, 3-wire connection	GRT1-ID4
4 PNP inputs	24 V DC, 6 mA, 3-wire connection	GRT1-ID4-1
8 NPN inputs	24 V DC, 4 mA, 1-wire connection + 4xG	GRT1-ID8
8 PNP inputs	24 V DC, 4 mA, 1-wire connection + 4xV	GRT1-ID8-1
4 NPN outputs	24 V DC, 500 mA, 2-wire connection	GRT1-OD4
4 PNP outputs	24 V DC, 500 mA, 2-wire connection	GRT1-OD4-1
4 PNP outputs with short-circuit protection	24 V DC, 500 mA, 3-wire connection	GRT1-OD4G-1
8 NPN outputs	24 V DC, 500 mA, 1-wire connection + 4xV	GRT1-OD8
8 PNP outputs	24 V DC, 500 mA, 1-wire connection + 4xG	GRT1-OD8-1
8 PNP outputs with short-circuit protection	24 V DC, 500 mA, 1-wire connection + 4xG	GRT1-OD8G-1
2 relay outputs	240 V AC, 2A, normally-open contacts	GRT1-ROS2
2 analogue inputs, current/voltage	±10 V, 0-10 V, 0-5 V, 1-5 V, 0-20 mA, 4-20 mA	GRT1-AD2
2 analogue outputs, voltage	± 10 V, 0-10 V, 0-5 V, 1-5 V	GRT1-DA2V
2 analogue outputs, current	0-20 mA, 4-20 mA	GRT1-DA2C

Note: Refer to Automation Systems catalogue for detailed specs and accessories information

## MECHATROLINK-II Cables

Name	Remarks	Model
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II Repeater	Network repeater	JEPMC-REP2000

## Other IO modules

Name	Remarks	Lenght	Model
MLII IO modules	64-point digital input and 64-point didital output (24VDC)	-	JEPMC-IO2310
	Analogue input: -10V to +10V, 4 channels	-	JEPMC-AN2900
	Analogue output: -10V to +10V, 2 channels	-	JEPMC-AN2910
I/O Cable for JEPMC-IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

## Computer Software

Specifications	Model
Trajexia Studio v1.0 or higher	TJ1-Studio

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.