

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6SL3055-0AA00-3FA0

DIGITAL I/O TERMINAL MODULE

Used with the applicable SINAMICS S120 TM15 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens SINAMICS S120 TM15 applicable manufacturer data

NOTICE**Damage through use of incorrect DRIVE-CLiQ cables**

Damage or malfunctions can occur on the devices or system when incorrect or unreleased DRIVE-CLiQ cables are used.

- Only use suitable DRIVE-CLiQ cables that have been released by Siemens for the respective application.

Note**Malfunctions due to polluted DRIVE-CLiQ interfaces**

Malfunctions can occur in the system through the use of polluted DRIVE-CLiQ interfaces.

- Cover unused DRIVE-CLiQ interfaces with the supplied blanking covers.

Note**Function equipotential bonding for distributed DRIVE-CLiQ nodes**

Integrate all of the components that are connected via DRIVE-CLiQ in the functional equipotential bonding concept. The connection should be preferably established by mounting on metallic bare machine and plant components that are connected with one another using an equipotential bonding conductor.

Alternatively, you can establish equipotential bonding using a conductor (min. 6 mm²), which as far as possible, is routed in parallel to the DRIVE-CLiQ cable. All distributed DRIVE-CLiQ nodes are involved, for example DME20, SME20, SME25, SME120, SME125 etc.

5.2 Terminal Module TM15

5.2.1 Description

The Terminal Module TM15 is a terminal expansion for snapping on to an EN 60715 DIN rail. The TM15 can be used to increase the number of available digital inputs/outputs within a drive system.

Table 5- 1 Interface overview of the TM15

Type	Quantity
DRIVE-CLiQ interfaces	2
Bidirectional digital inputs/outputs	24 (isolation in 3 groups each with 8 DI/DO)

5.2.2 Interface description

5.2.2.1 Overview

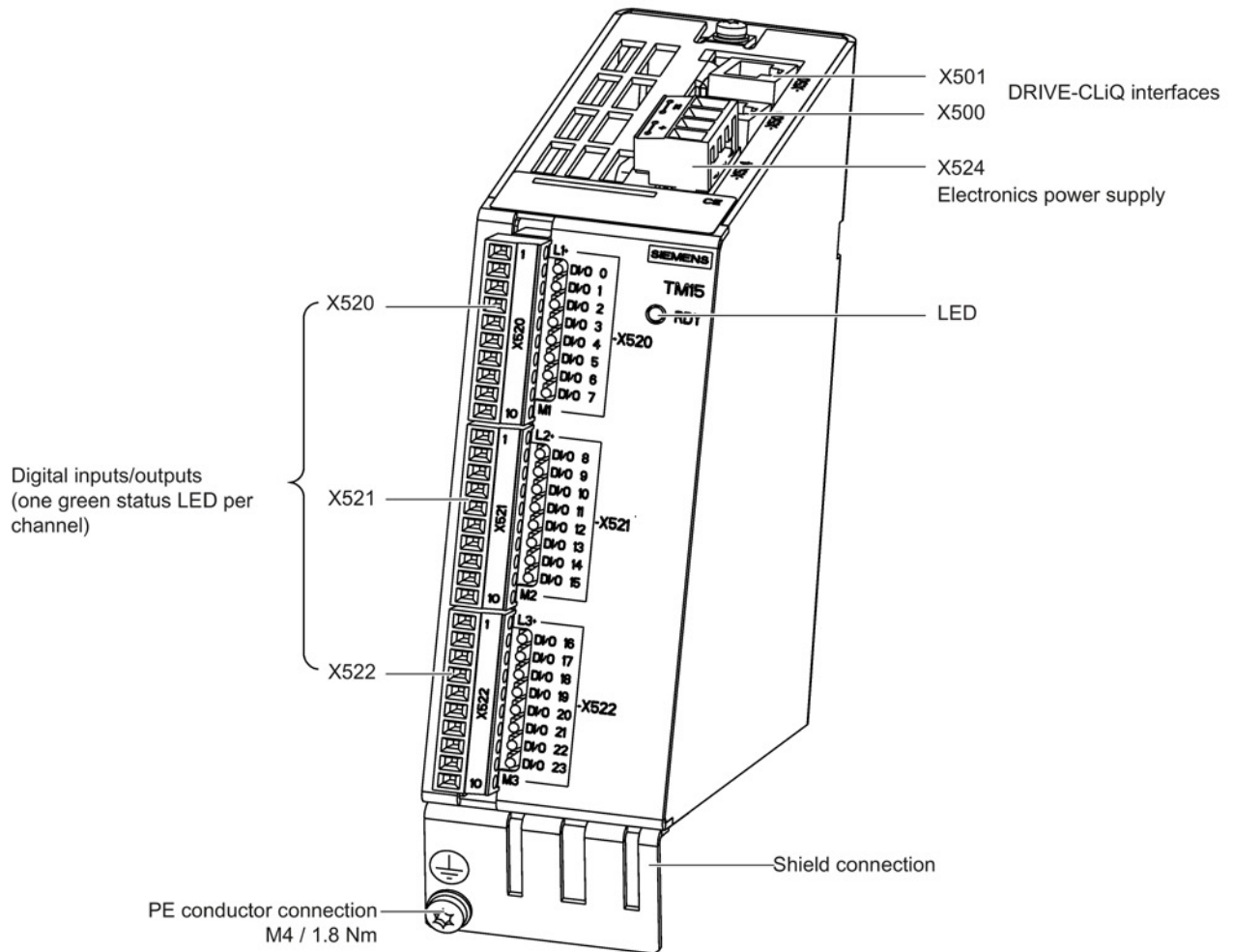
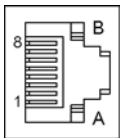


Figure 5-1 TM15 interface overview

5.2.2.2 X500/X501 DRIVE-CLiQ interfaces

Table 5- 2 X500/X501: DRIVE-CLiQ interfaces

	Pin	Signal name	Technical data
	1	TXP	Transmit data +
	2	TXN	Transmit data -
	3	RXP	Receive data +
	4	Reserved, do not use	
	5	Reserved, do not use	
	6	RXN	Receive data -
	7	Reserved, do not use	
	8	Reserved, do not use	
	A	+ (24 V)	Power supply
	B	M (0 V)	Electronics ground

The blanking covers for the DRIVE-CLiQ interfaces are included in the scope of delivery.

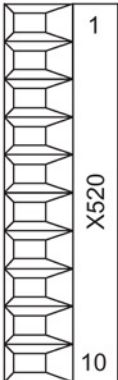
Blanking covers (50 x) Article No.: 6SL3066-4CA00-0AA0

Note

The maximum DRIVE-CLiQ cable length is 100 m.

5.2.2.3 X520 bidirectional digital inputs/outputs

Table 5- 3 X520: Digital inputs/outputs

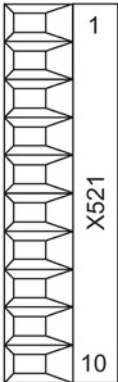
	Terminal	Designation ¹⁾	Technical data
	1	L1+	See Chapter, Technical data (Page 123).
	2	DI/DO 0	
	3	DI/DO 1	
	4	DI/DO 2	
	5	DI/DO 3	
	6	DI/DO 4	
	7	DI/DO 5	
	8	DI/DO 6	
	9	DI/DO 7	
	10	M1 (GND)	

Type: Screw terminal 1 (Page 331)

- ¹⁾ L1+: A 24 V DC power supply for DI/DO 0 to 7 (first potential group) must always be connected if at least one DI/DO of the potential group is used as output.
M1: A ground reference for DI/DO 0 to 7 (first potential group) must always be connected if at least one DI/DO of the potential group is used as either input or output.
DI/DO: bidirectional digital input/output

5.2.2.4 X521 bidirectional digital inputs/outputs

Table 5- 4 X521: Digital inputs/outputs

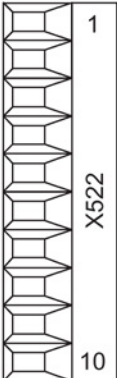
	Terminal	Designation ¹⁾	Technical data
	1	L2+	See Chapter, Technical data (Page 123).
	2	DI/DO 8	
	3	DI/DO 9	
	4	DI/DO 10	
	5	DI/DO 11	
	6	DI/DO 12	
	7	DI/DO 13	
	8	DI/DO 14	
	9	DI/DO 15	
	10	M2 (GND)	

Type: Screw terminal 1 (Page 331)

- ¹⁾ L2+: A 24 V DC power supply for DI/DO 8 to 15 (second potential group) must always be connected if at least one DI/DO of the potential group is used as output.
M2: A ground reference for DI/DO 8 to 15 (second potential group) must always be connected if at least one DI/DO of the potential group is used as either input or output.
DI/DO: bidirectional digital input/output

5.2.2.5 X522 bidirectional digital inputs/outputs

Table 5- 5 X522: Digital inputs/outputs

	Terminal	Designation ¹⁾	Technical data
	1	L3+	See Chapter, Technical data (Page 123).
	2	DI/DO 16	
	3	DI/DO 17	
	4	DI/DO 18	
	5	DI/DO 19	
	6	DI/DO 20	
	7	DI/DO 21	
	8	DI/DO 22	
	9	DI/DO 23	
	10	M3 (GND)	
Type: Screw terminal 1 (Page 331)			

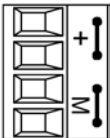
¹⁾ L3+: A 24 V DC power supply for DI/DO 16 to 23 (third potential group) must always be connected if at least one DI/DO of the potential group is used as output.

M3: A ground reference for DI/DO 16 to 23 (third potential group) must always be connected if at least one DI/DO of the potential group is used as either input or output.

DI/DO: Bidirectional digital input/output

5.2.2.6 X524 Electronics power supply

Table 5- 6 X524: Electronics power supply

	Terminal	Designation	Technical data
	+	Electronics power supply	Voltage: 24 V DC (20.4 ... 28.8 V) Current consumption: max. 0.6 A ¹⁾ Max. current through the jumper in the connector: 20 A (15 A according to UL/CSA)
	+	Electronics power supply	
	M	Electronics ground	
	M	Electronics ground	

Type: Screw terminal 2 (Page 331)

¹⁾ Including the current consumption for the digital outputs

The maximum cable length that can be connected is 30 m.

Note

The two "+" or "M" terminals are jumpered in the connector. This ensures that the supply voltage is looped through.

The current consumption increases by the value for the DRIVE-CLiQ participants.
 The digital outputs are supplied via terminals X520, X521 and X522.

5.2.3 Connection example

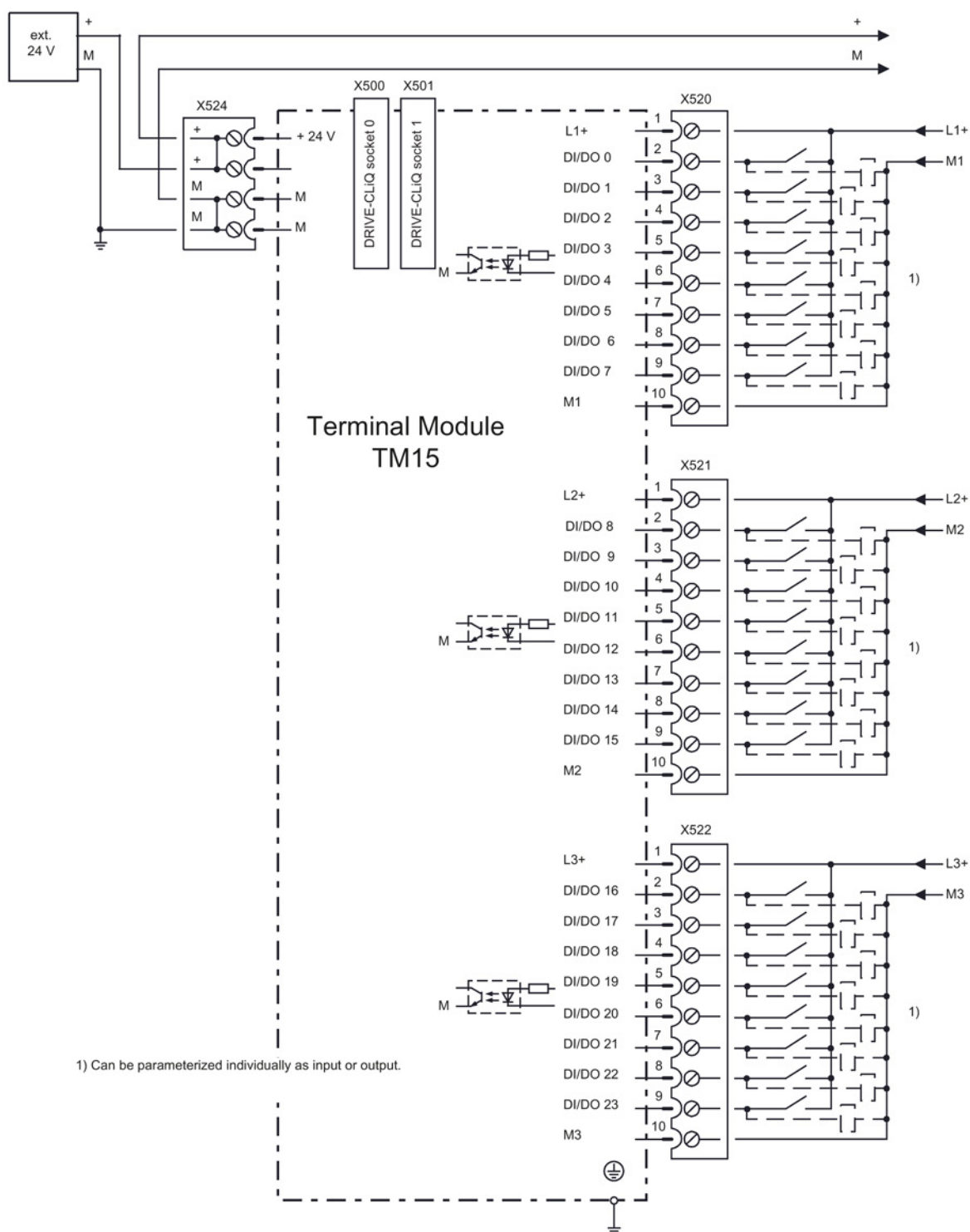


Figure 5-2 Example connection of TM15

5.2.4 Meaning of the LED

Table 5- 7 Meanings of the LEDs on the Terminal Module TM15

LED	Color	Status	Description, cause	Remedy
READY	-	Off	The electronics power supply is missing or outside the permissible tolerance range.	–
	Green	Continuous light	The component is ready for operation. Cyclic DRIVE-CLiQ communication is taking place.	–
	Orange	Continuous light	DRIVE-CLiQ communication is being established.	–
	Red	Continuous light	This component has at least one fault. Note: The LED is activated irrespective of whether the corresponding messages have been reconfigured.	Remove and acknowledge the fault.
	Green/ red	Flashing light 0.5 Hz	Firmware is being downloaded.	–
		Flashing light 2 Hz	Firmware download is complete. The system waits for POWER ON.	Carry out a POWER ON.
	Green/ orange or Red/ orange	Flashing light	Component recognition via LED is activated ¹⁾ . Note: Both options depend on the LED status when component recognition is activated.	–

¹⁾ The parameters for activating component recognition using LEDs can be taken from the following reference:
Reference: /LH1/ SINAMICS S120/S150 List Manual

Cause and rectification of faults

Additional information about the cause and resolving faults can be taken from the following references:

- Reference:/LH1/SINAMICS S120/S150 List Manual
- Reference: /IH1/ SINAMICS S120 Commissioning Manual with STARTER

5.2.5 Dimension drawing

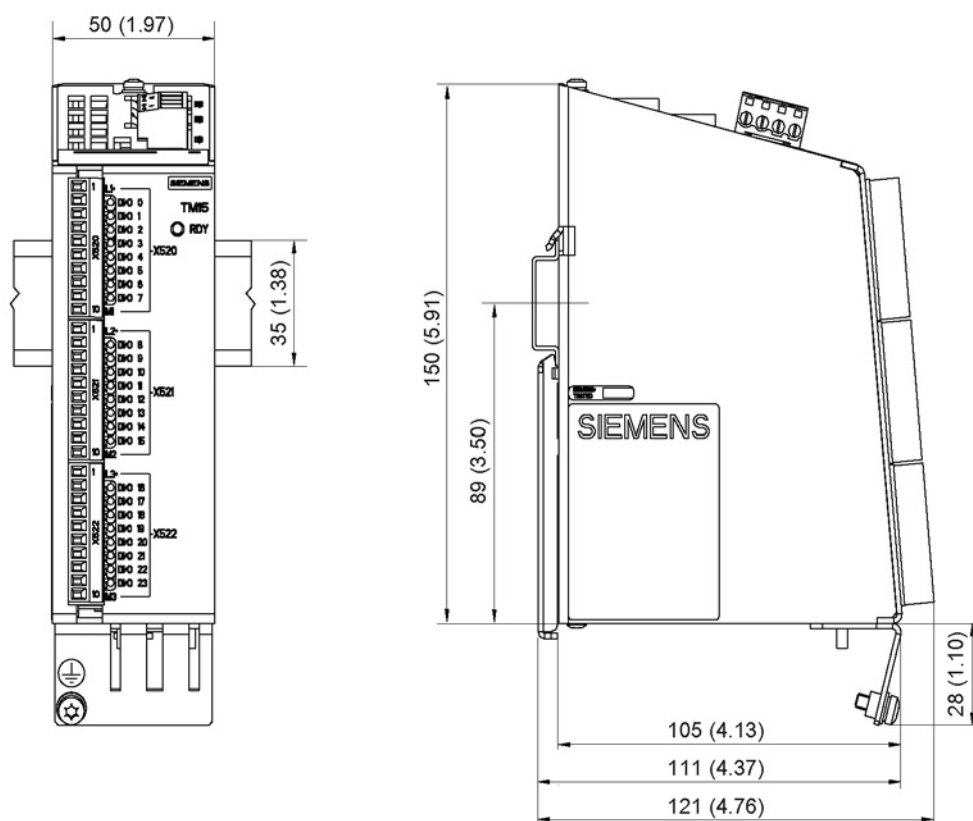


Figure 5-3 Dimension drawing of Terminal Module TM15, all data in mm and (inches)

5.2.9 Technical data

Table 5- 8 Technical data

6SL3055-0AA00-3FAx	Unit	Value
Electronics power supply		
Voltage	V _{DC}	24 (20.4 ... 28.8)
Current (without DRIVE-CLiQ or digital outputs)	A _{DC}	0.15
Power loss	W	< 3
Max. cable length	m	30
I/O		
Digital inputs/outputs	Can either be parameterized as DI or DO	
Number of digital inputs/outputs	24	
Electrical isolation	Yes, in groups of 8	
Max. cable length	m	30
Digital inputs		
Voltage	V _{DC}	-30 ... +30
Low-level (an open digital input is interpreted as "low")	V _{DC}	-30 ... +5
High level	V _{DC}	15 ... 30
Input Impedance	kΩ	2.8
Input current, typical (at 24 V DC)	mA	9
Max. voltage in the off state	V _{DC}	5
Current in OFF state	mA	0.0 ... 1.0 (per channel)
Typical input delay of the digital inputs	μs	"0" → "1": 50 "1" → "0": 100
Digital outputs (continued-short-circuit-proof)		
Voltage	V _{DC}	24
Max. load current per digital output	A _{DC}	0.5
Output delay (resistive load)		
Typical	μs	"0" → "1": 50 "1" → "0": 150
Maximum	μs	"0" → "1": 100 "1" → "0": 225
Min. output pulse (100% amplitude, 0.5 A with ohmic load)	μs	125 (typ.) 350 (max.)
Switching frequency		
For resistive load	Hz	Max. 100
For inductive load	Hz	Max. 0.5
For lamp load	Hz	Max. 10
Maximum lamp load	W	5
Max. switching frequency (100% amplitude, 50%/50% duty cycle; with 0.5 A and an ohmic load)	kHz	1 (typ.)
Voltage drop in ON state	V _{DC}	0.75 (max.) for maximum load in all circuits
Leakage current in OFF state	μA	Max. 10 per channel

6SL3055-0AA00-3FAx	Unit	Value
Voltage drop, output (I/O power supply to the output)	V _{DC}	0.5
Max. summed current of outputs (per group) up to 60°C up to 50°C up to 40°C	A _{DC} A _{DC} A _{DC}	2 3 4
Response time	The response time of the digital inputs/outputs comprises the following: • Response time on the component itself (approx. 1/2 DRIVE-CLiQ cycle). • Transfer time via the DRIVE-CLiQ connection (approx. 1 DRIVE-CLiQ cycle). • Evaluation on the Control Unit (see function diagram) Additional information can be taken from the following references: Reference: /LH1/ SINAMICS S120/S150 List Manual, Chapter "Function diagrams/Terminal Module 15"	
PE/ground connection	At the housing with M4 screw	
Weight	kg	1.0

5.3 Terminal Module TM31

5.3.1 Description

The Terminal Module TM31 is a terminal expansion that is snapped onto a EN 60715 standard mounting rail. Terminal Module TM31 can be used to increase the number of available digital inputs/digital outputs and also the number of analog inputs/analog outputs within a drive system.

The TM31 contains the following interfaces:

Table 5- 9 Interface overview of the TM31

Type	Quantity
DRIVE-CLiQ interfaces	2
Digital inputs	8
Bidirectional digital inputs/outputs	4
Analog inputs	2
Analog outputs	2
Relay outputs	2
Temperature sensor input	1