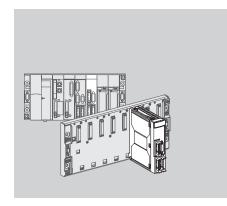
Modicon Premium PLCs TSX CCY 1128

Electronic Cam Module

Quick Reference Guide

Edition June 2009





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1 General

This documentation aims to help qualified technical personnel to install, operate and maintain the products described herein. Advanced users of our products should contact their nearest sales office for additional information.

The contents of this documentation are not contractual and may in no circumstances extend or restrict any binding warranty clauses.

2 Qualification of Personnel

Only **qualified personnel** are authorized to install, operate and maintain the products. Intervention by non-qualified personnel or failure to observe the safety precautions contained in this document or displayed on the equipment may risk the safety of personnel and/or the safety and reliability of equipment.

3 Warnings

These warnings are intended to indicate the particular risks to personnel and/or equipment. They are indicated according to their importance by a warning mark in the documentation and on the products:

Caution

Indicates that failure to follow the instructions or to heed the warning may lead to serious personal injury, death and/or significant damage to the equipment.

Important or /

Indicates that failure to follow the particular instructions may lead to minor personal injury and/or damage to the equipment.

Note

Highlights important information relating to the product, its handling or its accompanying documentation.

4 Conformity of Use

The products described in this documentation conform to the applicable European Directives* (CE marking). However, they can only be used correctly with the applications covered in the relevant documentation and with approved third party products.

(*) EMC (Electromagnetic Compatibility) and LV (Low Voltage) Directives.

5 Installing and Setting Up of Equipment

It is important to observe the following rules when installing and starting up equipment. In addition, if the installation includes digital links, it is essential to follow the basic wiring rules given in the manual "Electromagnetic Compatibility of Industrial Networks and Fieldbuses", reference TSX DG KBLE.

- Safety instructions must be followed meticulously. These instructions are in the documentation or on the equipment being installed and set up.
- The type of equipment defines the way in which it should be installed:
 - A flush-mountable device (for example, an operator terminal or cell controller) must be flush-mounted.
 - A device which is to be built in (for example, a PLC) must be placed in a cabinet or enclosure.
 - The casing of a laptop or portable device (for example, a programming terminal or a notebook) must remain closed.

- If the device is permanently connected, its electrical installation must include a device to isolate it from the power supplyand a circuit-breaker to protect it against overcurrents and isolation faults. If this is not the case, the power socket must be grounded and easily accessible. The device must be connected to the protective ground.
- If the device is supplied with 24 or 48 VDC, the low voltage circuits must be protected. Only
 use power supplies which conform to standards currently in force.
- Check that the supply voltages remain within the tolerance ranges defined in the technical specifications of the devices.
- All measures must be taken to ensure that any power return (immediate, warm or cold) does not lead to a state which may present a danger to personnel or the installation.
- Emergency stop devices must remain effective in all the device's operating modes, even those which are abnormal (for example, if a wire breaks). Resetting these devices must not cause uncontrolled or improper restarts.
- Cables which carry signals must be located where any capacitive, inductive, or electromagnetic interference will not affect the control system functions.
- Control system equipment and their control devices must be installed in such a way as to ensure that they protect against unintentional operation.
- Appropriate safety measures must be taken for the inputs and outputs, to prevent improper states in the control system device, if no signal is received.

6 Equipment Operation

The operational safety and reliability of a device is its ability to avoid the appearance of faults and to minimize their effects if they occur.

A fault inside the control system is known as:

- Passive, if it results in an open output circuit (no command is sent to the actuators)
- Active, if it results in a closed output circuit (a command is sent to the actuators)

From a safety point of view, a given fault is dangerous or not depending on the type of command given during normal operation. A passive fault is dangerous if the normal command is the operation of an alarm; an active fault is dangerous if it maintains or activates an undesirable command.

The system designer must **use devices external to the PLC** to protect against active faults inside the PLC, which may or may not be indicated.

7 Electrical and Thermal Specifications

Details of electrical and thermal characteristics are given in the associated technical documents (installation manuals, quick reference guides).

8 Maintenance

Troubleshooting Procedure

- Control system equipment should only be repaired by qualified personnel (after sales service
 engineer, or engineer approved by Schneider Automation). Only certified replacement parts
 or components should be used.
- Before performing any operation on equipment, cut the power supply off and mechanically lock any moving parts.

Replacing and Recycling Used Batteries

Use batteries of the same type as the originals and dispose of defective batteries in the same way as toxic waste.

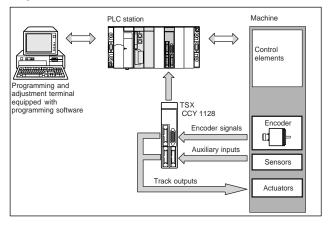
General Presentation

The TSX CCY 1128 is a standard format application-specific module in the Premium range. It can be integrated in a TSX RKY• rack on a TSX/PMX/PCX/PCI57 PLC station. It performs the "electronic cam" function for a rotary, alternating, cyclic or endless axis, managed by an incremental or absolute encoder.

Operating Principle

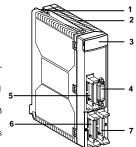
The module manages up to 128 cams independently. The cams may be distributed over a maximum of 32 tracks, to which up to 24 physical outputs and 8 logic outputs can be assigned. After transmission of configuration and adjustment data by the PLC processor, the module processes the cam program and controls the track outputs independently of the PLC scan.

· Diagram of an Installation

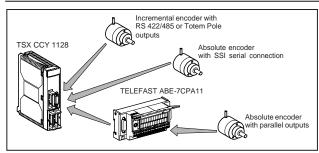


Physical Presentation

- Screw for attaching the module to the rack.
- 2 Module casing.
- 3 Display block comprising 4 LEDs:
 - green RUN LED
 red FRR LED
 - red I/O LED
 - areen CH0 LED
- 4 15-pin SUB D connector for connecting the encoder.
- 5 HE 10 connector for connecting the group 0 and 1 track outputs.
- 6 HE 10 connector for connecting the group 2 and 3 track outputs.
- 7 HE 10 connector for connecting the auxiliary inputs and the encoder power supply.



Presentation of the Types of Encoder Which can be Used



Compatibility with the Installed Base

Hardware Compatibility

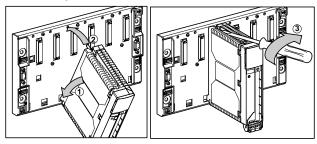
To take the TSX CCY 1128 module, the PLC station must be equipped with a processor TSX/PMX/PCX 57 •• 2 SV> 3.3. TSX/PCX 57 •• 3 or TSX/PCI 57 •• 4.

- SoftwareCompatibility
 - To develop an application which integrates the TSX CCY 1128 module:
 - -the PL7 Junior/Pro software must be version SV 3.4+ option or SV > 3.4.
 - the UnityPro software must be version SV ≥ 1.0.

Installing the Module in a PLC Station Rack

. Mounting in the Rack

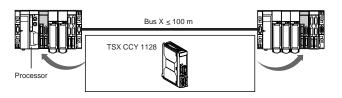
The TSX CCY 1128 module can be mounted in any of the available slots in a TSX RKY ↔ rack on a TSX57/PMX57/PCX/PC157 PLC station, except for the slots specifically for the power supply and processor modules. This single format module occupies a slot on the rack. The mounting procedure is identical to that of the Premium range standard format module, as shown in the diagram below.



. Mounting the Module in the PLC Station

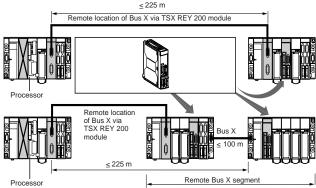
The TSX CCY 1128 module can be installed in any of the racks in a PLC station:

- Installation on a rack belonging to the main Bus X segment (segment on which the rack which supports the processor is installed)



- Installation on a rack belonging to a remote Bus X segment via a TSX REY 200 module (see diagram on next page).

Installing the Module in a PLC Station, continued



Installation Recommendations

- . Inserting and Removing a Module
- A module can be inserted or removed without switching off the rack power supply.
- Plugging and Unplugging Connectors on the Front Panel of the Module
 It is not advisable to plug or unplug the connectors located on the front panel of the module
 if the sensor/preactuator power supplies are switched on.
- . Maximum Tightening Torque of the Fixing Screw
 - module fixing screw on the rack: 2.0 N.m maximum
 - 15-pin SUB D connector fixing screw: 0.5 N.m

General Wiring Instructions

Cross-Section of Wires

This must be sufficient to prevent any line voltage drops and overheating.

Cable Routing

The connection cables of the encoders, sensors and preactuators must be kept away from any source of radiation caused by the switching of high power electrical circuits which could cause malfunctions.

• Encoder Signal Connection Cables

- They must be shielded using good quality shielding.
- They must only carry signals relating to the encoder.
- The cable shielding must be connected to the machine ground on the module side and the encoder side.
- There must be electrical continuity over the whole connection.

Selection and Protection of the Auxiliary Power Supplies

The encoders, sensors and preactuators associated with the module require the use of auxiliary power supplies (5 VDC and/or 24 VDC).

Type of Power Supply

Only regulated power supplies should be used which have a sufficiently long period of independent operation (≥ 10 ms) to deal with mains supply micro-cuts.

Protection of Power Supplies

The power supplies must be protected against overloads and short-circuits by fast-blow fuses of the appropriate rating.

Machine Grounding of the 0V

The 0V of the power supplies must be machine grounded as close as possible to the power supply output.

Encoder Power Supply

- It must only be used for supplying the encoder.
- It must be placed as close as possible to the TSX CCY 1128 module in order to reduce the coupling capacities as much as possible.

Choice of Encoder

The inputs of TSX CCY 1128 modules can receive signals from an encoder, which may be:

- · An incremental encoder.
- An SSI serial output absolute encoder.
- A parallel output absolute encoder. The last type requires the use of a special TELEFAST interface (ABE-7CPA11).

Encoder Output Interfaces

Туре	Supply	Output	Type of interface
of encoder	voltage	voltage	
Incremental	5 VDC	5VDC differential	Standard RS 422 line emitter
			outputs with 2 outputs per signal
			A+/A-, B+/B-, Z+/Z-
		1030VDC	Totem Pole outputs with one
			output per signal A, B, Z
Absolute	1030VDC	5VDC differential	Standard RS 422 line emitter
with SSI			outputs for the data signal
outputs			(SSI data)
			RS 422 compatible input for the
			clock signal (SSI CLK)
Absolute	5VDC or	5VDC or	Parallel outputs. Require the use
with parallel	1030VDC	1030VDC	of the ABE-7CPA11 Telefast
outputs			interface to convert the parallel
			output signals to serial signals.

Choice of Encoder, continued

• Encoder Power Supply

The design of the module enables the encoder to be supplied with either of the following:

- 5VDC
- 24 VDC, standard voltage in the range 10...30VDC

The choice of supply voltage depends on the supply voltage of the encoder.

5VDC Encoder Power Supply

The line voltage drop must be taken into account. This depends on:

- The length of the cable between the module and the encoder (length in both directions)
- The cross-section of the wire
- The consumption of the encoder

The voltage drop permitted by the encoder is generally 10% of the nominal voltage.

Voltage drop depending on the cross-section and length of wire (loop-back distance)

Wire cross-section	Voltage drop		er length wire an	d an encoder
	50 mA	100 mA	150 mA	200 mA
0.22 mm ² = 24 gauge	0.4V	-	-	-
0.34 mm ² = 22 gauge	0.25V	0.5V	-	-
0.5 mm ²	0.17V	0.34V	0.51V	-
1 mm ²	0.09V	0.17V	0.24V	0.34V

4

It is dangerous to increase the encoder supply voltage to compensate for a line voltage drop. If there is a load break, this may result in an overvoltage on the module inputs and damage them.

Electrical Continuity

To ensure correct operation in an environment which is subject to interference, it is essential to do the following:

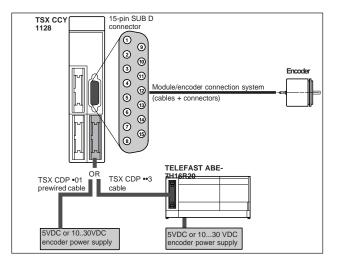
- Select an encoder whose metal casing is referenced to the machine ground of the connected device.
- Ensure that there is electrical continuity between the encoder, the connection cable shielding and the module.

Incremental or SSI Absolute Encoder

The 15-pin SUB D connector, located on the module front panel, connects the module to the encoder. The following pass via this connector:

- · All signals from and to the encoder.
- The encoder power supply source, which is itself connected to the HE10 connector:
 - either via an ABE-7H16R20 TELEFAST wiring interface,
 - or directly via a TSX CDP •01 prewired cable.

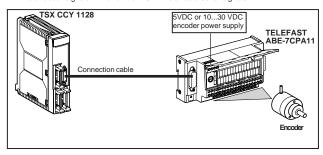
The design of the module enables the encoder to be supplied with either 5VDC or $10...30\,\mathrm{VDC}.$



Absolute Encoder with Parallel Outputs

The 15-pin SUB D connector, located on the module front panel connects the module to the encoder via a TELEFAST ABE-7CPA11sub-base.

- The sub-base receives:
 - All parallel signals from the encoder
 - The 5VDC or 10...30 VDC encoder power supply source
- The sub-base returns to the module:
 - The encoder signals in the form of RS 422 standard serial signals.



Note: As this type of encoder is seldom used, its connection to the TSX CCY 1128 module is only documented in the TSX CCY 1128 module setup manual - reference 35001387 - Chapter 7.

Pinout of the Module 15-pin SUB D Connector

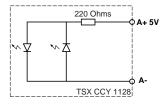
Diagram (view from the front)	Pin no.	Signal	Description
$\overline{}$	1	A+5V	Encoder input, pulse A+ (5VDC)
	2	A-	Encoder input, pulse A-
100	3	-	-
9	4	Z+5V	Encoder input, zero marker pulse Z+ (5 VDC)
$ (2) \sim $	5	Z-	Encoder input, zero marker pulse Z-
(10)	6	-	-
$(3) \stackrel{\smile}{\sim} (1)$	7	1030 V	Encoder power supply output (+ 1030 VDC)
10 (1)	8	0V	Encoder power supply output (- 0 VDC)
(4)	9	-	-
(12)	10	B+5V	Encoder input, pulse B+ (5 VDC)
	11	B-	Encoder input, pulse B-
[5]	12	-	-
(13)	13	EPSR	Encoder power supply return + input.
(6)	14	-	-
14)	15	5V	Encoder power supply output (+5 VDC)
7			
(15)			
(8)			

Equivalent Circuit Diagram of Module Encoder Inputs A, B and Z

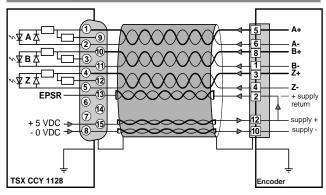
This diagram shows the equivalent circuit diagram of encoder input A, B or Z used with an incremental encoder which has:

- A line emitter output stage
- A 5VDC standard RS 422 output voltage

Note: Each A, B and Z input has a differential line check.



Connection Diagram



Recommendations

- Using a twisted pair:
 - Connect each encoder signal A+/A-, B+/B-, Z+/Z-.
- Connect each power supply point in order to reduce line voltage drops.
- Connect the cable shielding to the machine ground at both ends.
- ⚠

Before connecting the encoder to the module, check the pinout given by the encoder manufacturer.

Failure to follow this recommendation may result in damage to the encoder and the module.

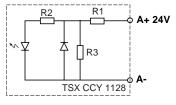
Pinout of the Module 15-pin SUB D Connector

Diagram (view from the front)	Pin no.	Signal	Description
(1) (9) (2) (10) (3) (1) (4) (12) (5) (13) (6) (7)	1 2 3 4 5 6 7 8 9 10 11 11 12 13	- A- B+24V Z- - 1030 V OV A+24V B- Z+24V EPSR	Encoder input, pulse A- Encoder input, pulse B+ (1030VDC)
(6) (7) (15) (8)	15	5V	Encoder power supply output (+5 VDC)

Equivalent Circuit Diagram of Module Encoder Inputs A, B and Z

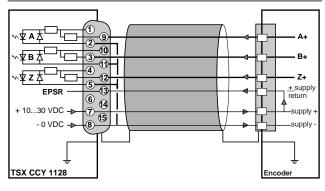
The following diagram shows the equivalent circuit diagram of encoder input A, B or Z used with an incremental encoder which has:

- · A Totem Pole output stage
- A 10...30 VDC output voltage



Note: Differential mounting is not possible. The - pole of each input (A-, B-and Z-) must be linked to the encoder 0V, and the + inputs (A+, B+ and Z+) to encoder outputs A+, B+, Z+.

Connection Diagram



Recommendations

- Connect the module EPSR input to the encoder supply + if the encoder does not have an EPSR output.
- Connect the cable shielding to the machine ground at both ends.
- ⚠ Before connecting the encoder to the module, check the pinout given by the encoder manufacturer.

Failure to follow this recommendation may result in damage to the encoder and the module.

Pinout of the Module 15-pin SUB D Connector

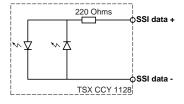
Diagram (view from the front)	Pin no.	Signal	Description
(1 9 (2 (1) (3 (1) (4 (12 (1) (3 (1) (4 (12 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Pin no. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Signal SSI data+ SSI data SSI CLK+ 1030V 0V EPSR SSI data- 5V	Description Encoder input, SSI data + (5 VDC) Encoder input, SSI data-
(8)			

Equivalent Circuit Diagram of Module Encoder Inputs A, B and Z

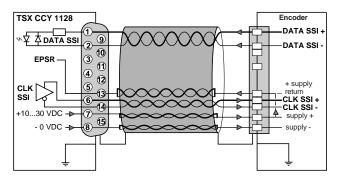
This diagram gives the equivalent circuit diagram of an SSI data input used with an SSI absolute encoder which has:

- · A line emitter output stage
- A standard RS 422/RS 485 5VDC output voltage

Note: The SSI data input has a differential line check.



Connection Diagram



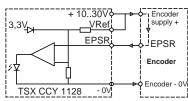
Recommendations

- Using a twisted pair:
 - Connect each encoder signal (SSI data, SSI CLK, EPSR).
 - Connect each power supply point in order to reduce line voltage drops.
- Connect the module EPSR input to the encoder power supply + if the encoder does not have an EPSR output.
- Connect the cable shielding to the machine ground at both ends.
- riangle Before connecting the encoder to the module, check the pinout given by the encoder manufacturer.
 - Failure to follow this recommendation may result in damage to the encoder or the module.

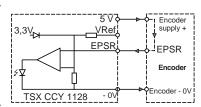
Principle

The EPSR input signal from the encoder is compared with:

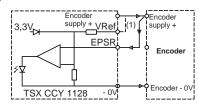
- Either a fixed voltage of 3.3 V generated internally, if the VRef input is not connected,
- Or a voltage equal to 66% of the voltage applied at the Vref input, + pole of the encoder supply voltage.
- Connection Diagram if the Encoder is Supplied with 10...30 V



 Connection Diagram if the Encoder is Supplied with 5 V



 Connection Diagram if the Encoder does not have a Power Supply Return



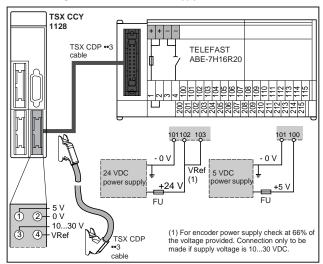
(1) Connection to be made if the encoder is supplied with 10...30V

Connection Diagrams

The encoder power supply is connected:

- Either via a TELEFAST ABE-7H16R20 wiring interface, which is itself connected to the module via a TSX CDP ••3 cable.
- Or directly via a TSX CDP •01 prewired cable.

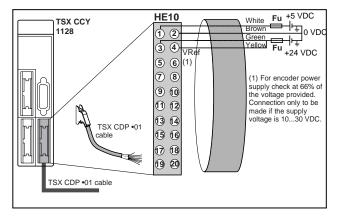
Connection Diagram for the Encoder Power Supply via a TELEFAST Interface



Catalog of TSX CDP ••3 connection cables

Cable reference	Length
TSX CDP 053	0.5 meters
TSX CDP 103	1 meter
TSX CDP 203	2 meters
TSX CDP 303	3 meters
TSX CDP 503	5 meters

Power Supply Connection Diagram using Prewired Cable TSX CDP •01



Catalog of TSX CDP •01 connection cables

Cable reference	Length
TSX CDP 301	3 meters
TSX CDP 501	5 meters

Recommendations

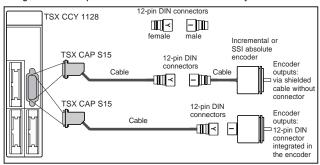
- Maximum length of the wires between the power supply outputs and the connection points on the TELEFAST: must be less than 0.5 meter.
- Protection on the power supply + : It is essential to install a 1A fast-blow fuse (Fu) on the power supply +.
- Machine grounding of the power supply 0V: This must be done as close as possible to the power supply output.

TSX CAP S15 Accessory

The kit consists of two 15-pin SUB D connectors which can be used to provide the interface for connecting the module to the encoder connection system.



. Integration of the 15-pin SUB D Connector in the Connection System



TSX TAP S1505/S1524 and TSX CCP S15• Accessories

Presentation

TSX TAP S1505 Accessory

- Function: Mechanical interface, equipped with two connectors which convert a 15-pin SUB D connector to a 12-pin DIN connector
- Use: Can be used in the module/encoder connection system to connect an RS 422 output incremental encoder supplied with 5 VDC.



TSX TAP S1524 Accessory

- Function: Mechanical interface, equipped with two connectors which convert a 15-pin SUB D connector to a 12-pin DIN connector.
- Use: Can be used in the module/encoder connection system to connect a Totem Pole output encoder supplied with 24 VDC.

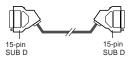


SUB D

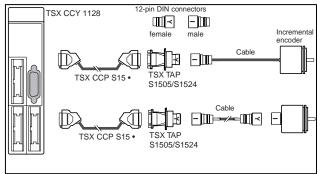
TSX TA S1505/S1524 and TSX CCP S15• Accessories, continued

TSX CCP S15. Accessory

- Function: Connection cable with 24 gauge wires and a 15-pin SUB D connector at both ends.
- Use: Can be used in the module/encoder connection system to connect the module to the TSX TAP S1505 or TSX TAP S1524.



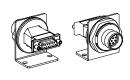
• Integration of the TSX TAP S1505/ S1524 and TSx CCP S15• Accessories in the Connection System

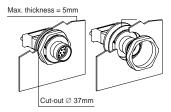


• Mounting the TSX TAP S1505 / TAP S1524 Accessories

Mounting on Telequick plate AM1-PA•

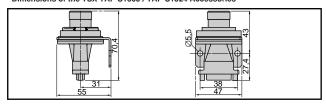
Mounting in enclosure feedthrough





TSX TA S1505/S1524 and TSX CCP S15• Accessories, continued

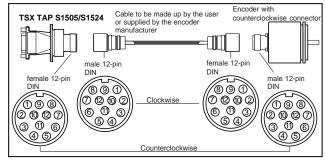
Dimensions of the TSX TAP S1505 / TAP S1524 Accessories



Clockwise and Counterclockwise Direction of the 12-pin DIN Connectors in the Connection System

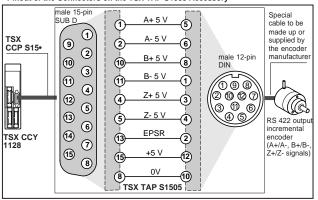
For ease of connection, the numbers of the pins on the 12-pin DIN connectors in the connection system must correspond exactly. For this, the pinout of these connectors must be:

- Clockwise for connectors which belong to the cable connecting the TSX TAP S1505/ S1524 accessory to the encoder
- Counterclockwise for connectors which belong to the encoder and to the TSXTAP S1505/ S1524 accessory

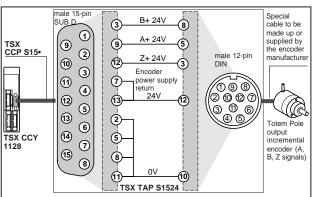


TSX TA S1505/S1524 and TSX CCP S15• Accessories, continued

Pinout of the Connectors on the TSX TAP S1505 Accessory

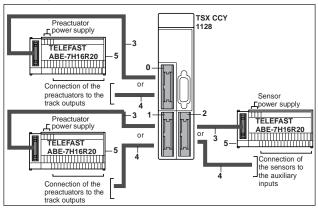


• Pinout of the Connectors on the TSX TAP S1524 Accessory



System for Connecting the Auxiliary Inputs and the Track Outputs

The following diagram illustrates the principle of the system for connecting the auxiliary inputs and track outputs.



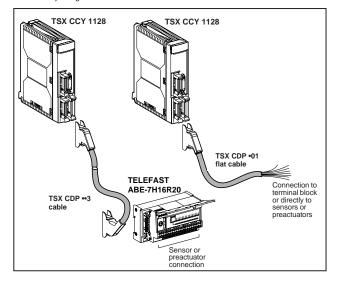
. Elements and Their Functions

Number	Element	Function
0	20-pin HE10	Connects the preactuators controlled by the group 0 and 1
	connector	track outputs and their power supply
1	20-pin HE10	Connects the preactuators controlled by the group 2 and 3
	connector	track outputs and their power supply
2	20-pin HE10	Connects the auxiliary input sensors and their power supply
	connector	as well as the encoder power supply
3	TSX CDP ••3	Connect the module to the TELEFAST sub-base.
	cables	.TSX CDP 053: 0.5 meters,
		TSX CDP 103: 1 meters, TSX CDP 203: 2 meters,
		TSX CDP 303: 3 meters, TSX CDP 503: 5 meters
4	TSX CDP •01	Connect the module I/O directly to the sensors
	flat cables	and preactuators.
		TSX CDP 301: 3 meters, TSX CDP 501: 5 meters
5	TELEFAST	Used to convert an HE10 connector to a screw
	ABE-7H16R20	terminal connector, for quick connection of
	sub-bases	sensors and preactuators

Connection Accessories

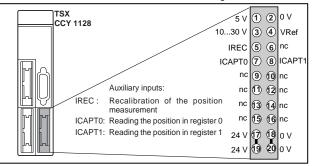
The sensors are connected to the auxiliary inputs and the preactuators to the track outputs in the following way:

- Either via a TELEFAST ABE-7H16R20 sub-base and TSX CDP •• 3 cable (recommended system).
- Or directly using a TSX CDP •01 flat cable.

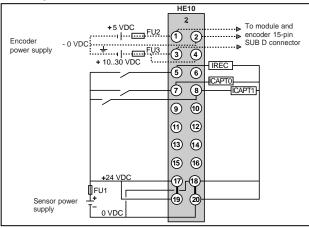


Connecting the Auxiliary Inputs

. Position of the HE10 Connector and Identification of the Signals

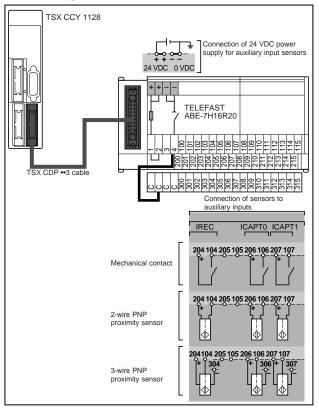


Circuit Diagram



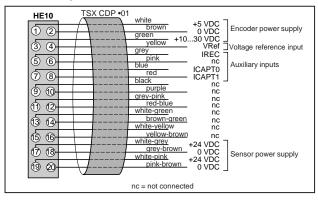
Connecting the Auxiliary Inputs, continued

• Connection Using TELEFAST Sub-Base and TSX CDP •• 3 Cable



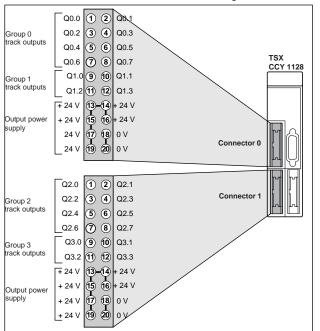
Connecting the Auxiliary Inputs, continued

ConnectionUsingTSX CDP •01Flat Cable



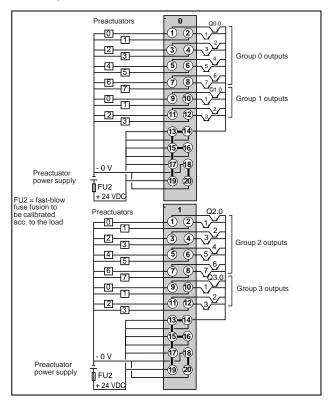
Connecting the Track Outputs

· Position of the HE10 Connectors and Identification of the Signals



Connecting the Track Outputs, continued

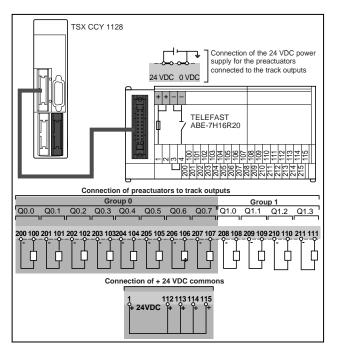
Circuit Diagram



Connecting the Track Outputs, continued

Connection Using TELEFAST Sub-Base and TSX CDP ••3 Cable
 Example of connecting the preactuators to the connector 0 track outputs (groups 0 and 1).

 Perform the same operations for connector 1 (output groups 2 and 3).



Connecting the Track Outputs, continued

• Connection Using TSX CDP •01 Flat Cable

grey-brown 0 VDC supply 0 VDC white-pink

General Specifications of the Module

Current consumption On internal 5V		typical	0.66 A
of the module		maximum	1 A
	On sensor/preactuator	typical	15 mA
	24V	maximum	18 mA
	On 1030V (when using	typical	11 mA
	an SSI absolute encoder	maximum	20 mA
	and single 24V power supply)		
Power dissipated in the	module	typical	7 W (1)
		maximum	10 W (2)
Sensor/preactuator supply monitoring		Yes	
Insulation resistance		> 10 Mohms at 500 VDC	
Dielectric strength with ground or PLC 0V		1000 Vrms-50/60Hz-1min	
Operating temperature		060°C	
Storage temperature		- 25°C to +70°C	
Relative humidity without condensation		5% to 95%	
Operating altitude		0 to 2000 m	

Under normal operating conditions: one auxiliary input active, 24 VDC supply voltage, standard RS 422 signals

(2) Under extreme operating conditions: 100% of auxiliary inputs active, 30 VDC supply voltage, etc

Encoder Input Specifications

Inputs			RS 422 operation	3030 VDC operation
Logic			Differential inputs	Positive or negative
Nominal	Voltage		-	24 V
values	Current		10 mA	15.5 mA
Limit	Voltage		≤ 5.5 V	≤ 30V (possible up to 34 V,
values				limited to 1 hour in every
				24 hours).
	At state 1	Voltage	> 3V (1)	≥ 11V
		Current	> 5.8 mA (1)	> 5 mA
	At state 0	Voltage	≤ - 3V	< 5V
		Current	≤ - 5.8 mA	< 2 mA
Input imped	ance at		-	1.5 kOhms
nominal volt	age			
Maximum Incremental		500 kHz with multiplication by 1		
permissible encoders frequency		250 kHz with multiplica	ation by 4	

- (1) The positive or negative differential voltage must be greater than 3V and the current in the positive or negative loop must be greater than 5.8 mA to ensure:
 - That counting pulses up to 500 kHz are taken into account
 - That the line check does not detect any errors whatever the frequency

Note: An encoder which has standard RS 422 outputs can control the inputs of two TSX CCY 1128 modules in parallel. To ensure the required voltage levels, the encoder supply voltage should be greater than 4.5V.

Specifications of the Encoder Power Supply Return

Parameters		Value
Limit values on the	Voltage	30 V (possible up to 34 V,
EPSR input		limited to 1 hour in every 24 hours).
-	Current	≤ 1.5 mA
Voltage for	VRef input not connected	OK if U > 3.3 V
OK state	VRef input connected to	OK if U > 66% of the voltage
	encoder power supply +	applied at VRef input

Specifications of Auxiliary Inputs IREC, ICAPT1 and ICAPT2

Parameters Symbol Value				
Nominal Voltage		Un	24 V	
values	rronnia <u>ronago</u>		In	8 mA
	Sensor power supply (including ripple)		U1	1930 V (possible up to 34 V for 1 hour in every 24 hours).
Limit	At state 1	Voltage	Uon	≥11V
values		Current	Ion	> 3 mA (at Uon)
	At state 0	Voltage	Uoff	< 5V
		Current	loff	< 1.5 mA
Response t	time	State 0 to 1	Ton	< 100 μs
		State 1 to 10	TOff	< 100 μs
Sensor volt	age	OK	Uok	> 18 V
Monitoring threshold Fault		Fault	Udef	< 14 V
Input impedance		Re	3 kOhms	
Input type			Resistive	
Logic type			Positive (sink)	
IEC 1131-2 compatibility				Type 1
2-wire/3-wii	re prox. senso	r 3-wire:	All 3-wire proximity sensors operate at 24 VDC	
compatibility 2-wire:		All 2-wire proximity sensors operate at 24 VDC with		
			the following specifications:	
			 Residual voltage at closed state ≤ 7 	
			 Minimum switching capacity: ≤ 2.5 mA 	
			 Residual current at open state: ≤ 1.5 mA 	
Dielectric strength with ground			1500 V rms	50/60 Hz for 1 min

Track Output Specifications

Parameters	S	Symbol	Value		
Nominal	Voltage		Un	24 V	
values	Current		In	500 mA	
Limit	Voltage		U1	1930V	
values	Max. current per out	out	I1	600 mA	
	for U = 30 or 34V				
	Maximum current	per connector	12	≤ 6 A	
		per module	13	≤ 12 A	
Max. power	for tungsten filament b	ulb	P1	10 W	
Max. switch	ing frequency on induc	tive load	F	< 0.6/LI ² Hz	
Electro disc			T	< L/R ms	
Preactuator	voltage monitoring	<u>OK</u>	Uok	> 18 V	
threshold		Fau	ılt Udef	< 14 V	
Compatibility with DC inputs				All positive logic DC inputs with input resistance of < 15 kOhms	
Protection against overloads and short-circuits			By currer tripping (0.7A <id-< td=""><td>at limiter and thermal</td></id-<>	at limiter and thermal	
Protection against output overvoltages				By Zener diode between the outputs and the + 24V	
Protection against polarity inversion				By diode reverse-mounted on the power supply	
Dielectric strength			1500V rm for 1 min	ns 50/60 Hz	
IEC 1131-2 conformity			Yes		

Physical Presentation

The module display block has 4 LEDs whose role it is to provide the user with information on:

- The operating mode of the module (normal operation, module faulty or off)
- Operating faults which are internal or external to the module



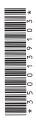
LED States and Their Meaning

. Operating Mode Display

LED	Color	State	Meaning
RUN	Green	Lit	Module operating normally
		Off	Module faulty or off

• Fault Display

LED	Color	State	Meaning
ERR	Red	Lit	Internal module fault, module failure
		Flashing	Communication fault with the processor
		-	Application missing, invalid or execution fault
		Off	Normal operation, no fault
I/O	Red	Lit	Fault external to the module:
			Wiring fault
			 Encoder power supply fault
			 Configuration/adjustment parameters refused
		Flashing	Not significant
		Off	Normal operation, no fault
CH0	Green	Lit	Normal operation, the channel is operational
		Flashing	The channel is not operating correctly, due to:
			an external fault
			a communication fault
		Off	The channel is inoperative:
			channel not configured
			channel incorrectly configured



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