

Presentation

Both the 140 DCF 077 00 PLC clock synchronization module and the 140 ERT 854 10 multifunction input module are designed for time and date stamped event logging applications.

The 140 DCF 077 00 PLC clock synchronization module provides the application program with accurate time and date stamped information, so that it can be associated with the occurrence of an event. The accuracy of discrimination therefore depends directly on the scan time.

This module is designed for the following areas of application:

- Time and date stamping of events
- Periodic time and date stamping of process values
- Time-based tables

The 140 ERT 854 10 multifunction input module is suitable for combining time and date stamping with variations of discrete inputs quickly and accurately.

This module can also be used for counting operations (maximum frequency of 500 Hz) on its discrete inputs.

This module is designed for the following areas of application:

- Status monitoring on discrete inputs
- Time and date stamped event logging
- Counting

Where necessary, the 140 ERT 854 10 multifunction input module offers the PLC application an image of the external clock fitted on this module. This user will be able to use this date/time information for the following areas of application:

- Periodic time and date stamping of process values
- Time-based tables

Operation

For the PLC clock synchronization module or for the multifunction input module, the information, time and date stamped in real time, made available to the application or used to operate event logging, is generated from a GPS or DCF signal, supplied by an external time receiver.

The GPS signal indicates Greenwich Mean Time, broadcast by GPS satellites. This date/time information is converted to DCF format, for example, by the 470 GPS 001 00 receiver CPU.

The DCF signal indicates Central European Time. It is broadcast on long wave by a transmitter located near Frankfurt. This date/time information is captured and transmitted in the form of a DCF signal, for example, via a DCF 77E receiver.

The 140 DCF 077 00 PLC clock synchronization module provides the Quantum automation platform with the following time-based data:

- Milliseconds, minutes, hours
- Day of week, day of month
- Month, year

This module is able to perform the following tasks:

- Time and date stamping of process states and messages in real time
- Periodic time and date stamping of process values, measurements and/or counter values
- Time-based tables: adjustment of actuator commands

The 140 ERT 854 10 multifunction input module is a module with 32 discrete inputs, 24 V to 125 V, integrating the following functions:

- **Discrete inputs:** scanned inputs transferred cyclically to the PLC program
- **Event-triggered inputs:**
 - Time and date stamped event logs on a FIFO memory buffer, integrated in the card, which can contain 4096 of these time and date stamped events concurrently
 - Validation by the user of transmission of these time and date stamped events to the PLC memory, checked by the application program

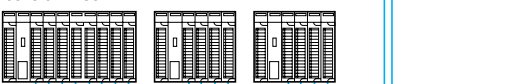
PLC rack with a clock synchronization module



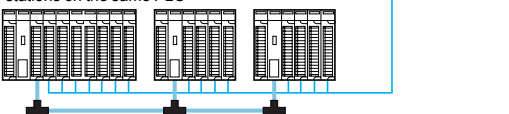
Configuration 1
All ERT 854 10 modules on the same PLC



Configuration 2
ERT 854 10 modules on several PLCs



Configuration 3
ERT 854 10 modules on several RIO stations on the same PLC



Operation (continued)

■ **Counter inputs:** counting on 32 event bits appearing at a maximum frequency of 500 Hz. Cyclical transfer of these counter values to the PLC memory.

■ **Periodic time and date stamping** of process values and logging of counter values according to the stated time intervals.

■ **Time-based tables:** special actions on the process actuators depending on the time. States consecutive to these actions can be logged by the multifunction input module.

Up to nine 140 ERT 854 10 multifunction input modules can be installed on the same rack, local or remote.

If the PLC configuration includes a 140 ERT 854 10 multifunction input module, it is not necessary to install a 140 DCF 077 00 PLC clock synchronization module for the application to have accurate date/time information.

Description

Description of the 140 DCF 077 00 PLC clock synchronization module

The 140 DCF 077 00 PLC clock synchronization module front panel comprises:

- 1 Module number and color code
- 2 A display unit consisting of 7 LEDs:
 - **R** (green): module running
 - **Active** (green): communication on the bus
 - **F** (red): fault
 - **DCF 77** (green): reception of date/time information, flashes in time with the input signal
 - **Status** (yellow): lights up once the signal supplied by the time receiver has been synchronized
 - **Error 1** (red): lights up when the signal supplied by the time receiver has not been synchronized for at least 60 minutes
 - **Error 2** (red): lights up when the signal supplied by the time receiver has not been synchronized
- 3 A standard Quantum module casing
- 4 An identification label (slipped inside the module door)
- 5 A flap for accessing the connectors and the terminal block
- 6 A reset button
- 7 A screw terminal block for connecting the external supply voltage, and also the signal provided by the time receiver (connector supplied with the module)
- 8 A module fixing screw

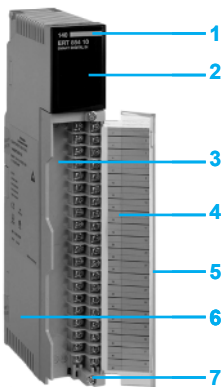
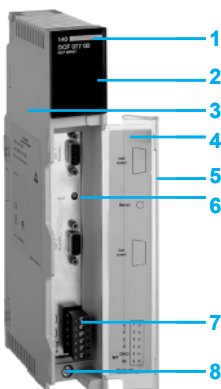
Description of the 140 ERT 854 10 multifunction input module

The 140 ERT 854 10 multifunction input module front panel comprises:

- 1 Module number and color code
- 2 A display unit consisting of 35 LEDs:
 - status LEDs for the 32 discrete inputs (1 to 32)
 - **R** (green): self-test OK, module ready
 - **Active** (green): communication on the bus
 - **F** (red): fault
- 3 A connection block for the discrete inputs (to be ordered separately)
- 4 An identification label (slipped inside the module door)
- 5 An access flap for the connection block
- 6 A standard Quantum module casing
- 7 A module fixing screw

To be ordered separately:

- A screw connection block with 40 terminals **140 XTS 002 00**
- A backup battery holder (optional) for **140 XCP 900 00** for storing, in the event of a power cut, time and date stamped events logged in the internal buffers of the 140 ERT 854 10 multifunction input modules (a module has one Quantum-format slot per rack)



Modicon Quantum automation platform

Accurate time stamping

PLC clock synchronization module and multifunction input module

Characteristics of the PLC clock synchronization module				
Module type		140 DCF 077 00		
Power supply	DCF receiver link	--- V	24, max. 30 mA	
	Internal, via the system bus	--- V	5, max. 300 mA	
DCF input	Number		1	
	Input voltage	--- V	24	
	Insulation		Optocoupler	
Processor	Micro-controller		80C32-25	
	Clock frequency	MHz	22.1184	
Memories	RAM	Kb	256, for data and the program + 2 for the DPM (? ? ?)	
	Flash	Kb	128, for the program and the firmware	
Connection	Time receiver (DCF or GPS)		1 plug-in connector with 6 screw terminals	
Characteristics of the multifunction input module				
Module type		140 ERT 854 10		
Power supply	Reference voltage, for each group of inputs	--- V	24...125 (max. 18...256), current consumption per group: max. 3 mA	
	Internal, via the system bus	--- V	5, max. 300 mA	
	Current consumption for data backup	mA	0.07 max, drawn on the batteries in the 140 XCP 900 00 module	
Process inputs	Number		32, divided into 2 groups	
	Input supply voltage	--- V	24...125	
	Insulation between channels and bus		Yes	
	Insulation between groups of channels		Yes (optocoupler)	
	Anti-bounce filtering		Configurable from 0 to 255 ms	
	Inversion of input states		Configurable	
	Maximum cable length	m	400 with unshielded cable, 600 with shielded cable	
	Level of switching	Nominal input voltage	--- V	24 48 60 125
		Min. current/signal at state "1"	mA	6 2.5 2.5 1
	Level 0 (OFF state)		Nominal 0% of the reference input voltage for the group, max. + 15%, min. - 5%	
	Level 1 (ON state)		Nominal 100% of the reference input voltage for the group, max. 125%, min. 75%	
Internal power consumption of the process inputs	W	7.5 max.		
Clock signal input	Number		1 input, data format complying with standard DCF 77, controlled for example by a DCF 77E receiver, or by a 470 GPS 001 00 receiver	
	Input power supply	--- V	24	
	Insulation		Optocoupler	
	Resolution (time and date stamping)	ms	1	
	Current required	mA	5	
Connection	Process inputs		By a screw terminal block, 40 terminals (140 XTS 002 00)	

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Accurate time stamping

PLC clock synchronization module and multifunction input module



140 DCF 077 00



140 ERT 584 10

References

Description	Functions	Reference	Weight kg
PLC clock synchronization module	Receives a DCF 77 signal Supplies the PLC application program with the current time and date stamped information: milliseconds, minutes, hours, day, date, month, year	140 DCF 077 00	0.450
Multifunction input modules	32 discrete inputs, supplied at between $\bar{\text{---}}$ 24 V and 125 V Status logging Counting 500 Hz	140 ERT 854 10	0.450

Separate parts

Description	Functions	Reference	Weight kg
DCF 77 clock signal receiver/generator	Receives, demodulates and amplifies the DCF 77 signal (built-in aerial)	DCF 77E (1)	–
	Receives a GPS satellite signal and converts it to DCF 77 format	470 GPS 001 00 (1)	–
GPS aerial	For 470 GPS 001 00 receiver	470 GPA 001 00 (1)	–
GPS aerial cable (12 m long)	Connection between 470 GPA 001 00 aerial and 470 GPS 001 00 receiver	470 XCA 646 00 (1)	–
Cable for PC (3 m long)	Connection between PC and 470 GPS 001 00 receiver for configuration	470 XCA 323 00 (1)	–
Screw connection block (40 terminals)	Connection of the 140 ERT 854 10 module inputs	140 XTS 002 00	–
Backup battery holder module	For backing up logs operated by 140 ERT 854 10 module(s)	140 XCP 900 00	–

(1) To order this product, contact our partner OHP:

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