2   EDCi Overview

This chapter provides a short description of all available EDCi devices. The **EDCi** electronics from DOLI are powerful and cost effective systems especially designed for data acquisition and closed-loop control of testing instruments. The **EDCi** systems technically succeed the well-established EDC family, starting with EDC5/25/100 and EDC60/120 up to EDC220V/222V/580V.

2.1   EDCi Application

Table 2: EDCi housing

Housing	EDCi10	EDCi15	EDCi20	EDCi22	EDCi50	EDCi52	EDCi70	EDCi72
Cabinet	✓	✓	✓		✓		✓	
Desktop				✓		✓		✓

- The **EDCi10** is designed for basic **static testing instruments**. Differences to EDCi20 are:
  - Smaller cabinet.
  - No iSI option slots.
  - No 160/320W DC drive and valve amplifiers.
  - No USB port for PC communication.
  - No standalone tests.
  - No IO signals, except IO Key for a simple RMC.
  - No serial and calculated sensors.
  - Reduced command set:
    - No block command.
    - No PC command.
    - No DynCycle sweeps, superposition, bimodal mode, modify flag.
    - No DoSA interface.
- The **EDCi15** is designed for **static creep testing instruments**. It includes the **iCREEP** distribution board with special designed connectors (no DOLI sensor plugs needed):
  - X7 SGS-IL incremental line driver sensor
  - X23A/X23C 2 x incremental 1Vpp sine sensors (Heidenhain ST1288/ST3088)
  - X2 8 x digital inputs/outputs
  - Y1 RS485 serial port for external temperature controllers
- The **EDCi20/22** are designed for **static testing instruments**. Three general purpose iSI option slots are on board. The **EDCi22** has a desktop housing and therefore an optional display, keyboard and internal 160/320W DC drive amplifiers are available.
- The **EDCi50/52** are designed for **static and dynamic testing instruments**. Three general purpose iSI option slots are on board. The **EDCi52** has a desktop housing and therefore an optional display, keyboard and internal 160/320W DC drive amplifiers are available.
- The **EDCi70/72** are designed for **static and dynamic testing instruments**. Eight general purpose iSI option slots are on board. The **EDCi72** has a desktop housing and therefore an optional display, keyboard and internal 160/320W DC drive amplifiers are available.

The **EDCi** fits for:

- Screw driven instruments. The **EDCi20/22/50/52** has a load channel and an incremental position channel with a controlled ±10 Volt output for power amplifiers. An iDCA or iCFA iSI board is available for the load channel at an **EDCi70/72**.
- Screw driven instruments with a specially adapted DOLI power amplifier for DC-servo motors. For servo motors with 160 W or 320 W, integrated amplifiers will be used (**EDCix2**).
- Screw driven instruments with any power amplifier. They are driven by a ±10 Volt or digital command output. All necessary control signals to drive external power amplifiers are provided.
- Hydraulic instruments, which are driven by a ±10 Volt powered valve.
- Hydraulic instruments, which are driven by a servo-valve.
- Dynamic instruments (**EDCi50/52/70/72**), which are driven either hydraulically / pneumatically by a servo-

valve or by a linear motor.
- Further load cells, LVDTs, extension gauges, extensometers, 2 channel incremental extensometers, serial controlled extensometers, further I/O's, synchronizing several EDCs in a multi-channel application. For these applications further options are needed!
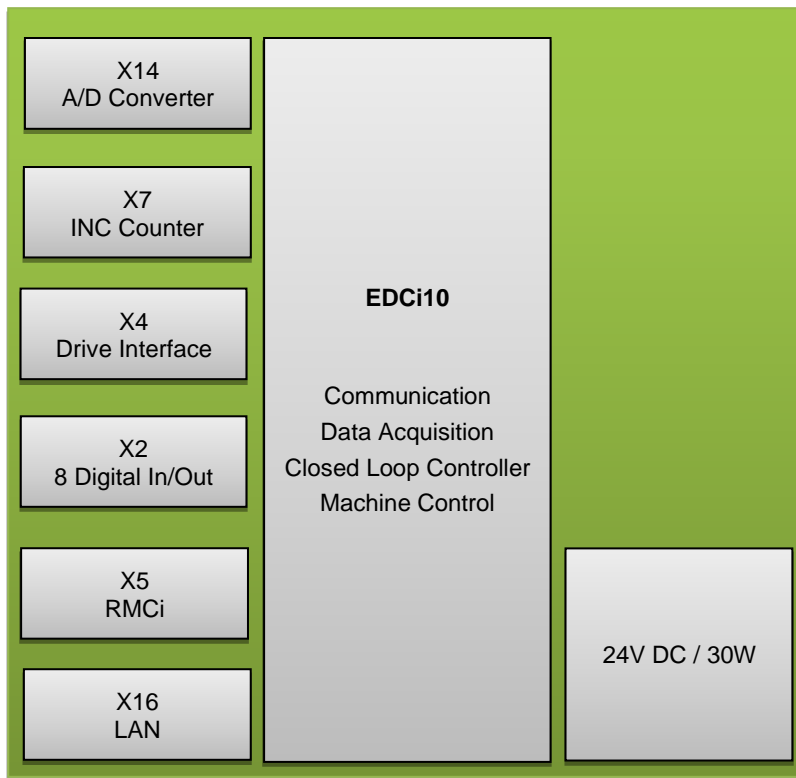
2.2 EDCi Block Diagram
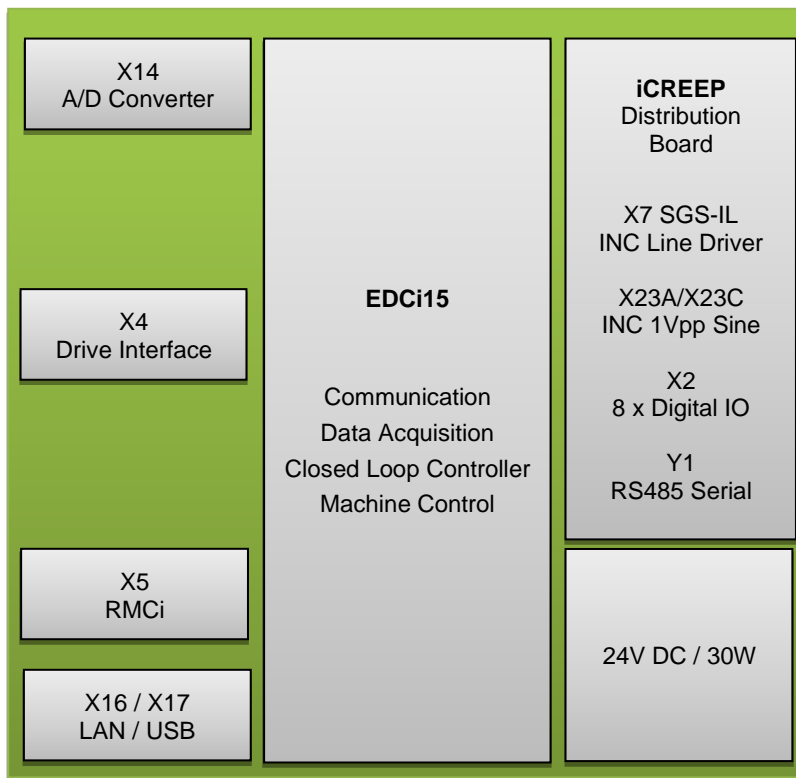

Fig. 1: Block diagram EDCi10

Fig. 2: Block diagram EDCi15

2.3 Technical Data Comparison EDCi

Table 3: Comparison technical data EDCi

Function	EDCi10	EDCi15	EDCi20 EDCi22	EDCi50 EDCi52	EDCi70 EDCi72
Maximum system and control loop frequency	1 kHz	1 kHz	2.5 kHz	10 kHz	10 kHz
Minimum system and control loop frequency	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz
Maximum test frequency (DoPEDynCycles command)	2 Hz	5 Hz	5 Hz	500 Hz	500 Hz
CPU VortexDX86 800 MHz	✓	✓	✓	✓	✓
PC communication interface USB 2.0 B full speed	-	✓	✓	✓	✓
PC communication interface LAN 10/100 MBit	✓	✓	✓	✓	✓
Load channel ±10,000,000 steps	✓	✓	✓	✓	-
Incremental encoder: TTL / Line Driver / Sine / SSI	✓	-	✓	✓	✓
Digital inputs/outputs with 24 VDC level	8	-	8	8	8
Serial RS232 sensor interface	-	-	O	O	O
Serial RS485 sensor interface	-	-	O	O	O
iSI extension slots	-	-	3	3	8
iCREEP distribution board: 1xINC Line, 2xINC Sine, RS485, 8xIO	-	✓	-	-	-
Power supply 24 VDC, 1.5 A plus external consumption (**EDCix0**)	✓	✓	✓	✓	✓
Supply voltage 100 - 240 VAC, 50/60 Hz, 900 VA100-250 VAC (**EDCix2**)	-	-	✓	✓	✓
Internal 24 VDC, 2 A power supply for external devices (**EDCix2**)	-	-	✓	✓	✓
Cabinet housing (**EDCix0**)	✓	✓	✓	✓	✓
Desktop housing (**EDCix2**)	-	-	✓	✓	✓
EDC synchronization of data acquisition and motion control	✓	-	O	O	O
Drive interface: - ±10V command output with ±15Bit resolution - Digital command output, A/B pulse train - I/O's and relays for safety functions	✓	✓	O	O	O
External DriveBox: - ±10V command output with ±15Bit resolution - Digital command output, A/B pulse train - I/O's and relays for safety functions - 16 digital inputs/outputs with 24V level	-	-	O	O	O
Any external DC / AC power amplifier	O	O	O	O	O
Hydraulic power pack	-	-	O	O	O
Internal servo valve amplifier up to 300mA	-	-	O	O	O
Internal 160W DC power amplifier (**EDCix2**)	-	-	O	O	O
Internal 320W DC power amplifier (**EDCix2**)	-	-	O	O	O

✓ Included   O Optional   - Not possible

2.5 Plug Assignment

The following table shows a connector overview of the EDCi.

Table 5: Connector overview of the EDCi

Connector	Function	EDCi10	EDCi15	EDCi20 EDCi22	EDCi50 EDCi52	EDCi70 EDCi72
X2	Universal digital I/O	✓	✓	✓	✓	✓
X4	Drive interface	✓	✓	✓	✓	✓
X5	RMC	✓	✓	✓	✓	✓
X7	Crosshead input INC- or SSI-transducer	✓	(✓)	✓	✓	✓
X11	Synchronization, SYNC In	✓	-	✓	✓	✓
X12	Synchronization, SYNC Out	✓	-	✓	✓	✓
X13	USB host for USB sticks	✓	✓	✓	✓	✓
X14	Load input	✓	✓	✓	✓	-
X16	LAN PC interface	✓	✓	✓	✓	✓
X17	USB PC interface	-	✓	✓	✓	✓
X18	Motor connection or 10V-Command-Output, Moog valve, internal power amplifier	✓	-	✓	✓	✓
X19	24V voltage supply (**EDCix0**)	✓	✓	✓	✓	✓
X21	iSI extension slot	-	-	✓	✓	✓
X22	iSI extension slot	-	-	✓	✓	✓
X23	iSI extension slot	-	-	✓	✓	✓
X24	iSI extension slot	-	-	-	-	✓
X25	iSI extension slot	-	-	-	-	✓
X26	iSI extension slot	-	-	-	-	✓
X27	iSI extension slot	-	-	-	-	✓
X28	iSI extension slot	-	-	-	-	✓
X40	External DriveBox	-	-	✓	✓	✓
X61	Up to four calculated sensors	-	✓	✓	✓	✓
X62	Up to four serial sensors at Y1	-	✓	✓	✓	✓
X63	RMC Digipoti	✓	✓	✓	✓	✓
Y1	RS232 option (or RS232/RS485 converter) for serial sensors	-	(✓)	✓	✓	✓

2.5.1   Plug Assignment EDCi10

Fig. 5: Rear view EDCi10

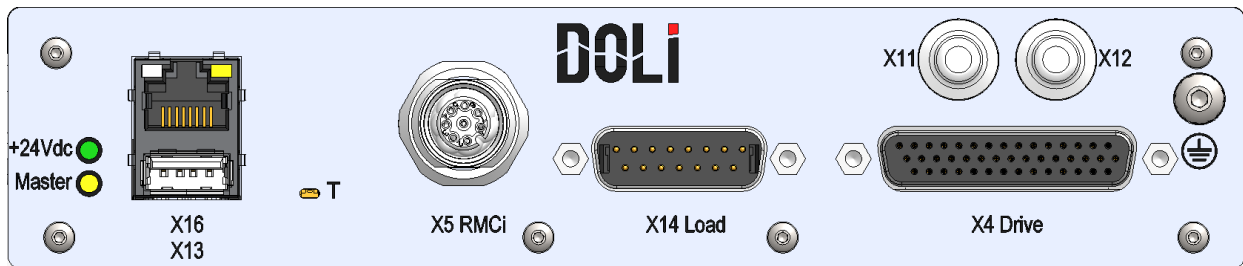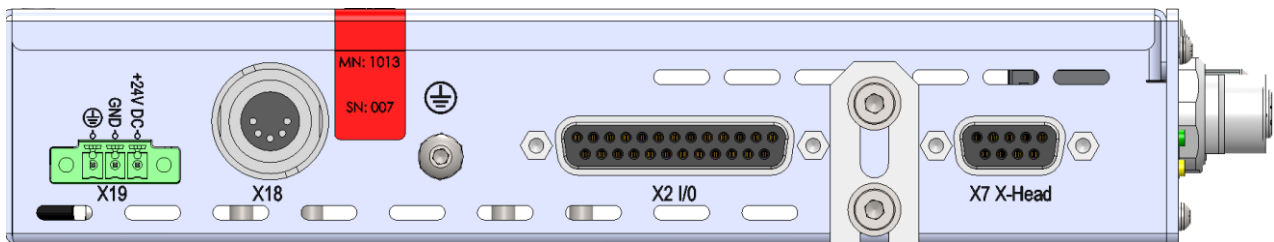*Fig. 6: Side view EDCi10*

Dimensions: L 200 mm   W 190 mm   H 42 mm