



## **ACOS 7 Series**

Automation and Telecontrol

## ACOS 7 Series

The ACOS 7 automation and telecontrol series from IDS offers high-performance devices and systems which are specially designed to meet the requirements of the utility industry. Here, the focus is both on easy and efficient engineering and on investment security. The RTUs from the ACOS 7 series fulfil high security demands in accordance with the BDEW whitepaper.

Thanks to their universal communication capabilities and a variety of models, together with a uniform software platform, the ACOS 7 series RTUs enable the configuration of open and freely scalable telecontrol, automation and communication networks. The different models are perfectly matched to enable the creation of optimally harmonized systems for each and every task, depending on the scope of information, functionality and the necessary communication interfaces.

### Compact RTUs

The compact RTUs ACOS 710, ACOS 711 and ACOS 720 can be easily integrated into existing SCADA environments via standard protocols, thereby enabling defined and economical solutions. They are particularly suitable for small-scale applications, such as:

- Feed-in management for decentralized power generation plants
- Local network stations in electric power distribution grids
- Direct marketing

Thanks to a wide range of data acquisition and transmission features these compact RTUs can be universally used. The optional GSM/GPRS or TETRA solution is particularly suitable for the quick and easy connection of systems without an existing communication infrastructure. The compact RTUs include VPN technology (OpenVPN/IPSec) which provide the necessary protection for communication via public networks.

The RTUs have the following features:

- Plastic housing for direct installation on TS35 mounting rails
- 1 or 2 serial RS232 interfaces
- 1 network interface
- Comprehensive communication applications for telecontrol and field bus protocols
- Integrated I/O level, with up to 8 digital inputs, 4 digital outputs, 2 analog inputs and 1 analog output, depending on the RTU model.

In addition, ACOS 710 and ACOS 720 possess an integrated Quad Band GSM/GPRS module (optional). Initial parameterization can be carried out locally via web interface through the microSD card.

Moreover, ACOS 720 has an integrated PLC-based on CODESYS® V3 for small-scale automation applications and can be supplemented by additional I/O modules:

- Programming according to IEC 61131-3
- Expansion by up to 8 compact modules

With the ACOS 711 device, IDS offers a compact RTU with integrated TETRA module. Transmission of data takes place via IEC 60870-5-101 protocol in the TETRA SDS mode.



ACOS 710 HB/GSM

# ACOS 750

## Automation and Telecontrol



### Design

ACOS 750 is a modular system with multi-processor capability, consisting of a module carrier, power supply, CPUs and connected communication, interface and process I/O modules. It can be connected via EtherCAT® bus system. Installation of system components is type-dependent and can be done either in the module carrier or through connection to the module carrier. As an option, connection of process I/O modules can also be done in a decentralized manner. For this purpose, system modules based on standard Ethernet and solutions via FO cable are available. This makes ACOS 750 easily configurable, scalable and expandable.

ACOS 750 has the following features:

- Module rack for direct installation on TS35 mounting rails
- Redundancy-capable power supply modules
- Redundancy-capable CPUs
- Standard I/O modules in a sturdy metal housing
- Compact modules in a plastic housing
- Standard I/O modules for control voltages up to 220 V DC/230 V AC
- Standard measurement system including monitoring of power quality
- Expansion by central and decentral standard modules and compact modules

### Automation and Telecontrol



ACOS 750 unites powerful automation and sturdy telecontrol features in one single RTU. Tasks that formerly had to be solved separately by means of a PLC and a separate RTU can now be implemented throughout by one single system. The integrated PLC-based on CODESYS® V3 enables the implementation of complex automation tasks and programming in accordance with IEC 61131-3.

### Station Automation

Based on the modular ACOS 750 system, it is possible to build up highly flexible station automation systems on IEC 61850 basis for low-, medium-, high- or extra-high voltages. Standard measuring system and command output modules enable the direct connection of measuring transducers, the synchronization of supply networks and direct control of switch drives without intermediate converters or coupling relays. A wide range of functions is available for complex automation applications, including switchgear interlocking, switching sequences, transformer and earth fault coil control, emergency feed-in control and emulation of the busbar voltage.

### Visualization

ACOS OP07A is a universal monitoring and control unit for telecontrol and automation applications using RTUs of the ACOS 7 series. Thanks to its high electro-magnetic compatibility, it is extremely suitable for applications close to the process as local control unit in switchgear.

## Communication

Thanks to a wide variety of data transmission capacities, the devices from the ACOS 7 series can be universally used for automation and telecontrol tasks:

- IEC 60870-5-101 Master/Slave
- IEC 60870-5-104 Client/Server
- IEC 60870-5-103 Master
- IEC 61850\*
- SMS messaging
- Modbus RTU Master/Slave
- Modbus TCP Client
- 3964R/RK512 Master
- Profibus DP<sup>®</sup>V0 Master\*
- NTP time synchronization
- GPRS connections
- VPN encryption (OpenVPN/IPSec)

\* only ACOS 750

For this purpose, you can use various means of data transmission, e.g. TETRA, public and private radio networks, DSL etc.

## Parametrization and Diagnostics

ACOS ET enables easy and user-oriented engineering for IDS telecontrol and automation systems:

- Project administration in single-user and multi-user projects
- Intuitive operation and operator guidance via wizard
- Graphic device engineering
- Set-up of communication links via graphic network plan

- Certificate management
- Device parameterization via microSD card, either locally or through remote data transmission
- Comprehensive diagnostic facilities (event logs, hardware diagnostics, online process values, web interface)
- Data traffic analysis for IEC 60870-5-101/-104 connections
- Terminal report for quick documentation of the bit test
- Back-reading of device parameterization from the RTU
- Data import/export via MS EXCEL<sup>®</sup> CSV files

The interaction with the IDS HIGH-LEIT SCADA system creates additional benefits as regards consistency and efficiency. In the event of migrations, data models can be easily included and synchronized. Engineering of the telecontrol network is done exclusively by means of ACOS ET.

## IT Security

The automation and telecontrol devices of the ACOS 7 series conform to the following security requirements:

- Secure initial commissioning via microSD card
- Secure access for parameterization and servicing
- Integrity check of the device parameterization
- Secure web server access via HTTPS and authentication via user name and password
- Dynamic firewall
- Encrypted data transmission (IEC 60870-5-104) according to IEC 62351-5 based on certified authentication
- Port authentication IEEE 802.1X
- Recording of security-relevant actions, incidents and errors in SYSLOG
- Project-related assignment and administration of user rights (authorization) and support of a centralized user management (Active Directory)

Do you want to know more about our products and solutions? Please get in touch!  
We are happy to help you.

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## ACOS 710/720 (LA variant) – Technical Data

	ACOS 710	ACOS 720
Processor	PowerPC MPC8313	
Memory	128 MB DDR2 RAM, 128 MB data/application flash	
Memory expansion (accessories)	microSD card (max. 4 GB)	
Time keeping	Via buffered real-time clock, min. back-up time, 7 days	
PLC programming	-	IEC 61131-3 with CODESYS® V3 1.5 MB program memory 128 kB MRAM for remanent variables
Service and parameterisation interface	Mini-USB 2.0 Typ B (Device)	
Communication interfaces	2x RS232/V.24, max. speed 115 kbit/s 1x Ethernet 10/100 Base-TX, auto-MDI(X), auto-negotiation Connection via RJ45 jacks	
Integrated GSM/GPRS module (optional)	Quad-Band/GPRS class 12 SIM card externally accessible SMA antenna input	
Integrated digital I/Os	4 digital inputs 24 V DC 4 digital outputs 24 V DC, 200 mA	
Integrated analog I/Os	2 analog inputs ±25 mA, 16 Bit 1 analog output ±20 mA, 16 Bit	
Connection of compact I/O modules	-	max. 8 modules, supply of EtherCAT®-Bus with max. 1 A/5 V DC
Voltage supply	24 V DC (± 20 %)	
Aux. Voltage output	24 V DC/100 mA, galvanically isolated	
Power input	10 W	15 W
Housing	Polycarbonate V0, degree of protection IP20	
Dimensions (WxHxD)	183x132x46 mm	206x132x68 mm
Installation	On carrier rail (TS35) acc. to DIN EN 60175	
Ambient conditions		
Storage and transport	-40...85 °C	
Operation	-20...55 °C, horizontal installation position	
Relative air humidity	95 % (without condensation)	

## ACOS 720 – Compact Modules

Product No.	Name	Description
160050576	cDI73A	8 channel digital input, 24 V DC, filter 3 ms
160050825	cDO72A	4 channel digital output, 125 V AC/30 V DC, 0.5 A
160050577	cDO73A	8 channel digital output, 24 V DC, 0.5 A
160050599	cAI71A	2 channel analog input, 0...20 mA, differential input, 16 Bit
160050582	cAI71B	2 channel analog input, -10...+10 V, differential input, 16 Bit
160050578	cAI72A	4 channel analog input, 0...20 mA, differential input, 16 Bit
160050600	cAO71A	2-channel analog output, 0...20 mA, resolution 16 Bit
160050581	cAO71B	2 channel analog output, -10...+10 V, resolution 16 Bit
160050579	cAO72A	4 channel analog output, 0...20 mA, resolution 16 Bit
160050589	cCI70A	1 channel digital counting pulse input, 24 V DC, 100 kHz
160050590	cCI71A	2 channel digital counting pulse input, 24 V DC, 1 kHz

# Compact RTUs    Technical Data

## Compact RTUs    Product variants

### Compact RTUs (Hx variant) – Technical Data

	ACOS 71x HA	ACOS 71x HB
Processor	PowerPC MPC8313	
Memory	128 MB DDR2 RAM, 128 MB data/application flash	
Memory expansion (accessories)	<b>ACOS 710:</b> microSD Card (max. 4 GB)	
Time keeping	Via buffered real-time clock, min. back-up time, 7 days	
Service and parameterisation interface	Mini-USB 2.0 Typ B (Device)	
Communication interfaces	1x RS232/V.24, max. speed 115 kbit/s 1x Ethernet 10/100 Base-TX, auto-MDI(X), auto-negotiation Connection via RJ45 jacks	
Integrated GSM/GPRS module	<b>ACOS 710:</b> Quad-Band/GPRS class 12 SIM card externally accessible; SMA antenna input	
Integrated TETRA module	<b>ACOS 711:</b> Frequency: 380..430 MHz Max. Transmitting power: 3W at 50 Ohm Authentication and encrypting TEA-1, TEA-2, TEA-3 Antenna connector: FME plug	
Integrated digital I/Os	4 digital inputs 5...60 V DC 4 digital inputs 60 V DC, 60 VA (relay)	4 digital inputs 5...60 V DC 4 digital inputs 60 V DC, 60 VA (relay) 4 digital inputs 24 V DC S0
Integrated analog I/Os		2 analog inputs ±25 mA, 16 Bit 1 analog output ±20 mA, 16 Bit
Voltage supply	15 V DC (± 5 %) with 230 V AC power adapter	
Aux. Voltage output	24 V DC/50 mA, galvanically isolated	
Power input	10 W	
Housing	Polycarbonate V0, degree of protection IP20	
Maße (BxHxT)	183x132x46 mm	
Installation	On carrier rail (TS35) acc. to DIN EN 60175	
Ambient conditions		
Storage and transport	-40...85 °C	
Operation	-20...55 °C, horizontal installation position	
Relative air humidity	95 % (without condensation)	

### ACOS 710/711/720 – Product variants

Product No.	Product name	Voltage supply
160050793	ACOS 710 LA	24 V DC
160050791	ACOS 710 LA/GSM	24 V DC
160050789	ACOS 720 LA	24 V DC
160050788	ACOS 720 LA/GSM	24 V DC
160050790	ACOS 710 HA/GSM	15 V DC (with 230 V AC power adapter)
160050792	ACOS 710 HB/GSM	15 V DC (with 230 V AC power adapter)
160050831	ACOS 711 HA/TETRA	15 V DC (with 230 V AC power adapter)
160050839	ACOS 711 HB/TETRA	15 V DC (with 230 V AC power adapter)

# ACOS 750 Technical Data Module Overview



## ACOS 750 – Central Processor Units

	CU73A	CU73A/GSM	CU73B
Processor	PowerPC MPC8313		
Memory	256 MB DDR2 RAM, 512 MB data/application flash		
Memory expansion (accessories)	microSD card (max. 2 GB)		
Time keeping	Via buffered real-time clock, min. back-up time: 7 days		
PLC programming	IEC 61131-3 with CODESYS® V3, 1.5 MB program memory 128 kB MRAM for persistent variables		
Service and parameterization interface	1x miniUSB 2.0 Typ B (device)		
Communication interfaces	1x RS232/V.24, 1x RS485, 2-/4 wire 1x Ethernet 10/100 Base-TX, auto-MDI(X), auto-negotiation		2x RS232/V.24  1x Ethernet 10/100 Base-TX, auto-MDI(X), auto-negotiation
Integrated GSM/GPRS module		Quad-Band/GPRS class 12 SIM card externally accessible SMA antenna input	
Max. number of additional modules	6		128
Product No.	160050804	160050843	160050798

## ACOS 750 – Basic Components and Communication

Product No.	Name	Description
<b>Standard module carriers</b>		
160050596	SB71A	2 slots
160050597	SB72A	4 slots
160050598	SB73A	8 slots
160050836	SB7A-12	12 slots
160050779	SB74A	16 slots
<b>Compact module carriers</b>		
160050586	SB71B	2 slots plus intergrated adapter for compact modules
160050587	SB72B	4 slots plus intergrated adapter for compact modules
160050811	SB73B	8 slots plus intergrated adapter for compact modules
160050812	SB74B	16 slots plus intergrated adapter for compact modules
<b>Power supply modules</b>		
160050572	PS7LA	Power supply module 24...60 V DC, galvanically isolated from system, parallel operation possible
160050573	PS7HA	Power supply module 110...230 V AC/DC, galvanically isolated from system, parallel operation possible
160050853	SM7SB	Power supply module 24 V DC
<b>Communication modules</b>		
160050606	SW72A	Unmanaged Ethernet-Switch, 4x Ethernet 10/100 Base-TX
160050833	SW72B	Managed Fast Ethernet-Switch, 3x Ethernet 10/100 Base-TX, 2x Ethernet 100 Base-FX (SC duplex), RSTP, MRP
160050805	CC73A	Communication Controller, 2x Ethernet 10/100 Base-TX, 3x RS232/V.24
160050806	OC73A	Communication Controller, 1x Ethernet 10/100 Base-TX, 1x Ethernet 10/100 Base-FX (SC duplex), 3x RS232 optical (ST)

■ January 2016, Technical modifications reserved.

## ACOS 750 – Standard Modules

Product No.	Name	Description
I/O modules combined		
160050770	DI75A	32 channel DI, 24...60 V DC
160050837	IO75A	16 channel DI, 24...60 V DC / 8 channel DO, 60 V DC / 4 channel AI $\pm 25$ mA
160050832	CO75A	16 channel CO, 24...60 V DC, 1-out-of-n and external circuit check 16 channel DI, 24...60 V DC
Digital I/O modules		
160050604	DI74A	16 channel digital input, 24...220 V DC
160050768	DI74B	16 channel digital input, 60...220 V DC
160050769	DI74C	16 channel digital input, 220 V DC
160050681	DO74A	16 channel digital output, 220 V DC / 230 V AC
160050865	CO73B	8 channel CO 24...220 V DC, 1-out-of-n and external circuit check, 1kVA
160050852	CO71A	2 channel CO, 24...220 V DC / 8 channel DI, 24...220 V DC / 2 channel DO 220 V DC/230 V AC
Analog I/O modules		
160050772	AI73A	8 channel analog input, $\pm 25$ mA, resolution 16 bits
160050773	AO72A	4 channel analog output, $\pm 24$ mA, resolution 16 bits
Measurement system		
160050855	MS72A	4 channel current input, 1/5 A
160050857	MS72B-SC	4 channel voltage input, 400 V, synchrocheck
160050859	MS73C-SC	4/4 channel power input, 1/5 A, 400 V, synchrocheck
160050856	MS72B-PQ	4 channel voltage input, 400 V, power quality
160050858	MS73C-PQ	4/4 channel power input, 1/5 A, 400 V, power quality
System modules		
160050809	EE71A	EtherCAT® Extender, 2x OUT (2x RJ45)
160050810	EE71B	EtherCAT® Extender, Multimode FO, 2x OUT (2x SC duplex)
160050776	EC71A	EtherCAT® Coupler, ID switch, 1x IN, 1x OUT (2x RJ45)
160050777	EC71B	EtherCAT® Coupler, ID switch, Multimode FO, 1x IN, 1x OUT (2x SC duplex)
Ambient conditions		Temperature -20 ° ... 70 °C Relative air humidity < 95 % (without condensation)

## ACOS 750 – Compact Modules

Product No.	Name	Description
Communication modules		
160050607	cSI71A	Interface module, 2x RS232
160050680	cSI71B	Interface module, 2x RS485
160050588	cPC70A	Profibus DPV0 controller, 1x RS485
I/O modules		
160050576	cDI73A	8 channel digital input, 24 V DC, filter 3 ms
160050825	cDO72A	4 channel digital output, 125 V AC/30 V DC, 0.5 A
160050577	cDO73A	8 channel digital output, 24 V DC, 0.5 A
160050599	cAI71A	2 channel analog input, 0...20 mA, differential input, 16 bits
160050582	cAI71B	2 channel analog input, $\pm 10$ V, differential input, 16 bits
160050578	cAI72A	4 channel analog input, 0...20 mA, differential input, 16 bits
160050600	cAO71A	2 channel analog output, 0...20 mA, resolution 16 bits
160050581	cAO71B	2 channel analog output, $\pm 10$ V, resolution 16 bits
160050579	cAO72A	4 channel analog output, 0...20 mA, resolution 16 bits
160050589	cCI70A	1 channel digital counting pulse input, 24 V DC, 100 kHz
160050590	cCI71A	2 channel digital counting pulse input, 24 V DC, 1 kHz
System modules		
160050591	cER70A	EtherCAT® Bus Refresher (5 V DC, 2 A), Input auxiliary voltage (24 V DC, max. 10 A)
160050592	cES70A	Input auxiliary voltage (24 V DC, max. 10 A)
160050580	cEC71A	EtherCAT® Coupler, 1x IN, 1x OUT (2x RJ45)
160050609	cEC71B	EtherCAT® Coupler, ID switch, Multimode FO 1x IN, 1x OUT (2x SC duplex)
160050593	cEE70A	EtherCAT® Extender, 1x OUT (1x RJ45)
160050610	cEE70B	EtherCAT® Extender, multimode FO, 1x EtherCAT® OUT (1x SC duplex)
Ambient conditions		Temperature 0 ° ... 55 °C Relative air humidity < 95 % (without condensation)