

## Product Guide





## Features

- Function logic configuration tool according to IEC 61131-3 standard for ABB range of protection relays and terminals for distribution applications
- Graphical and textual configuration of mimic panels
- Loading of function and mimic configurations to the target product
- General parameter setting support
- User friendly tool management
- Parameter file upload/download and compare function
- Graphical I/O Setting Tool for REX 521
- Configuration and parameter file printing support
- Manually initiated uploading of disturbance recorder data
- Versatile integration of disturbance data evaluation tools of your choice
- Easy switching between verified setting groups or setting banks
- Reset of protection relay
- Presents relay indications, measurement, calculated values and registered values
- Connection to the station bus alternatively directly to a protection relay or a terminal using SPA or LON communication protocol
- Support for SPA communication over the TCP/IP network.
- Flexible object based tree-structure navigator
- Object oriented project data management
- Project import/export facility
- Excellent commissioning tools
- Easy to upgrade to support new functions and products
- All tools and documentation provided on one CD
- Uninstall function

## Application

The CAP 505 Relay Product Engineering Tools is aimed for commissioning, maintenance, service and monitoring of the process and its secondary equipment in distribution substations.

The package includes the following tool functions:

- Relay configuration
- Mimic panel configuration
- Configuration download
- Project import/export
- Parameter setting and archiving
- Compare between parameter settings in the relay and the archive
- Upload and download of parameter setting files
- Printing of parameter setting files
- Edit history of parameters
- Protection relay setting bank switching
- Reset of protection trip function
- Upload of disturbance recorder files
- Upload of registered, measured and calculated values
- Multi layered tree structure navigator

As the tools in CAP 505 are fully consistent with CAP 501 stand-alone tool packages, SMS 510 substation monitoring system and the LIB 500 application libraries, work generated by CAP 505 can easily be reused in a larger SMS system or in a full-fledged SA system.

The range of protection and control terminals with SPA communication supported in CAP 505 Revision 2.5.0:

- The entire SPACOM range including SACO annunciators
- The Multipurpose Relay Series REJ 5\_\_/REU 5\_\_
- The REF 541/543/545 Integrated Protection and Control Terminals
- The REM 543/545 Integrated Machine Protection and Control Terminals
- The RET 541/543/545 Integrated Transformer Protection and Control Terminals
- The REX 521 Integrated Protection and Control Terminal
- The REC 501/523 Control Terminals
- The REF 610, REM 610 and REU 610 protection relays

Further information about CAP 505 and its application in single relay applications and in local and remote system solutions can be found in the full product documentation on the product CD-ROM.

## Design

A station control and protection system contains numerous components and functions. CAP 505 is the tool box for data handling during the engineering and maintenance of relay projects.

The CAP 505 product consists of a base system with a navigator on which support tools for the protection and control terminals are run.

The communication between the computer and the target is run either using the LON communication protocol or the SPA protocol. using serial or TCP/IP.

### Categorization of the software parts

#### Base System

Kernel software, communication configuration, additional base tools and services are providing a framework for the object types and tools.

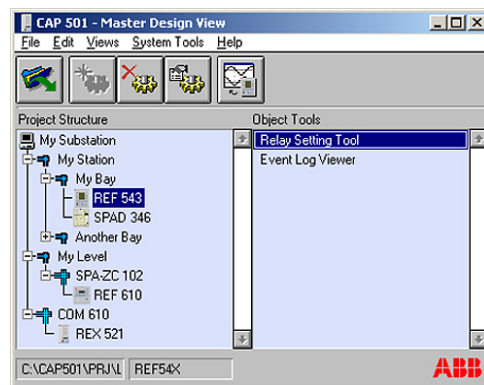


Fig. 1 CAP 505 Navigation window

#### Project structure navigator

The Project structure navigator is a window in which you open tools and close your session. It is possible to add and delete tools on the System Tools menu.

#### System Configuration tool

The communication setup is done with the system configuration tool

#### Project Export/Import tool

The tool is used for project management purposes. Creating a project, defining default projects for the objects tools, project duplication and project delete are among the functions included.

The tool is used when projects are transferred to other systems or brought to the user's current collection of projects.

#### Relay Configuration tool

The functional configuration of the protection relays and control terminals is done with this tool. Functions to be configured are: protection scheme, control scheme, I/O set-up, measurements, condition monitoring, power quality and other similar type of functions.

The graphical programming language is based on the IEC 61131-3 standard. Function blocks are available for a variety of protection, control, measurements functions.

#### Mimic Configuration tool

The tool is used for configuring the graphical front display on the control terminals. The configuration includes breakers, disconnectors, interconnections, alarms, measurements, and texts defined by a user.

#### Downloading tool

The function and mimic configurations are downloaded to the target product by means of this tool. The storing of the configuration in the non-volatile memory of the protection or control terminal and the restart of the terminal are included as well.

#### Relay Setting tool

The relay setting tool includes all functions belonging to parameter, register- and input values and reset functions. The package include a separate tool for SPACOM products and another tool for all other terminals. The parameter sets are mostly created off-line and then downloaded to the products. Existing parameter files in the products can be uploaded and edited as well.

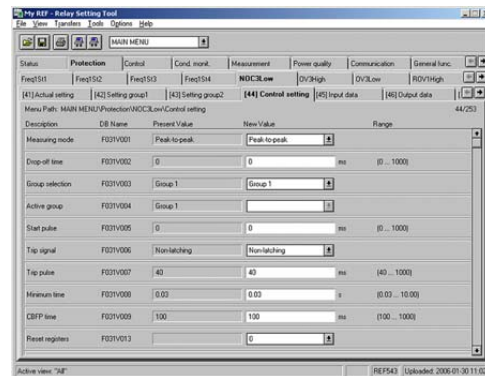


Fig. 2 Relay Setting Tool

**Graphical I/O Setting Tool**

Graphical I/O Setting Tool is a complementary to Relay Setting Tool, and it is used to set digital inputs, digital outputs and alarm LED signals of REX 521 relays in an easy way. The routing of signals is presented with graphical connection matrix where it is possible to connect a signal to a function block, or vice versa.

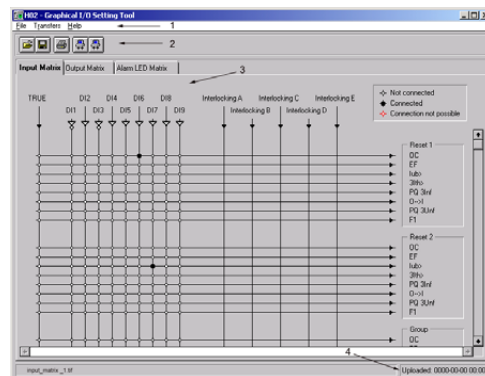


Fig. 3 Main view of the graphical I/O setting tool

**Disturbance Recorder tool**

Includes the functionality to upload and present disturbance recordings.

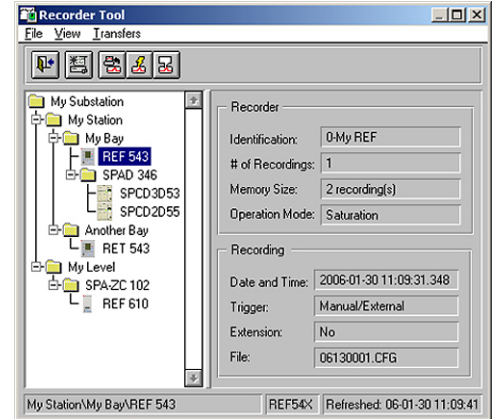


Fig. 4 Disturbance Recorder Tool window

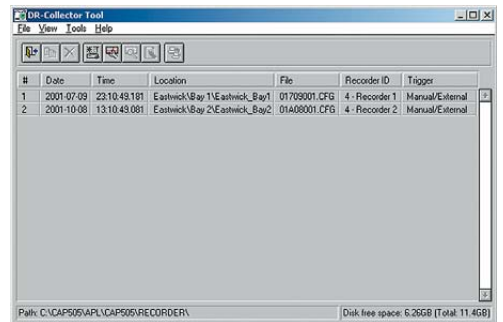


Fig. 5 DR\_collector Tool window

**System configuration**

The tool package is delivered on a CD which can be installed on a PC with Microsoft Windows XP Professional or Windows 7 32-bit operating system.

The PC communicates to the station bus, to the protection relay or to the terminal using the SPA or LON protocol via a product specific cable connected between the PC's COM port or LON port and the communication interface of the relays or over the TCP/IP via an Ethernet adapter connected to the relay.

**Document files**

CAP 505 documentation in PDF format and an installer for installing the Acrobat® Reader from Adobe Corporation are included on the CD. The Acrobat Reader is needed to view the documentation

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**Technical data**

CAP 505 v.2.5.0 sets the following hardware and software requirements for the PC:

**Software requirements**

Operating system	Microsoft® Windows XP® Professional, Microsoft® Windows 7 32-bit. The latest Service Packs installed.
Network	Operating system network software installed with at least one network protocol (e.g. TCP/IP)

**Hardware requirements**

Item	Minimum	Recommended
Processor	233 MHz or higher Pentium® compatible CPU	1 GHz or higher Pentium compatible CPU
Memory	128 MB	256 MB
Display	SVGA, 800x600, 256 colours	SVGA, 1024x768, 256 colours
File system	NTFS	
Hard disk space	300 MB	500 MB
CD-ROM drive	Any device supported by the operating system. Required for installation	
Mouse	Any device supported by the operating system	
PCI slots	One slot for each PCLTA-20 card	
PCMCIA slots	One slot for each PCC-10 card	
Network adapter card	Any device supported by the operating system	

**Ordering**

The following alternatives are available:

- CAP 505 version v.2.5.0. tool package CD-ROM. Ordering number is 1MRS151017

Communication cables listed in the next table are not included in the CAP 505 delivery.

Required communication cables can be acquired by placing a separate order, see the table below:

**Communication hardware**

Relay	Type	Order number
REF 541, 543, 545 REM 543, 545 RET 541, 543, 545 REX 521 REJ 51_ / 52_ REU 513, 523	Opto	1MKC950001-2
REC 523	RS 232	1MRS120520
REF 610, REM 610, REU 610	Opto.	1MRS050698
SPTO front connector SPCR front connector	RS 232 - RS 232	SPA-ZP 17A3
SPACOM 100/300 series	RS 232 - TTL connector	SPA-ZP 5A3
SPAC 300/500/600 rear	RS 232 - RS 485	SPA-ZP 6A2
SACO 16A3, 16D1, 16D3 and 64D4	Connection cable for SPA-ZP 6A2 to SACO screw terminal	SPA-ZP 21A and SPA-ZP 6A2

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