## First step: The input/output matrix

Before you start with the programming of the CFC-chart, the required input/output routing in the matrix must first be completed. The CFC-chart extensively interfaces with the input/output matrix. Every annunciation, measured value or control command used in the CFC-chart must first be routed accordingly in the input/output matrix.

The input/output matrix is the hub of information flow. Here, the source and destination of all the information flow of the device is configured e.g. if you require a measured value to be displayed on the graphic default display, the appropriate measurement must be routed in the matrix with a cross in the appropriate column (default display).

Before programming the CFC-chart make a list of all the annunciations, commands etc. that will be used as inputs and outputs of the CFC-chart. These must then be defined and routed in the input/output matrix so that they will be available when programming the CFCchart. Information must be separated into the types CFC source and destination. Source CFC is information coming from the CFC logic and destination CFC is information going to the CFC logic.

The following steps must be carried out:

1. In the default settings check whether the required information destination CFC element is already routed. If not, then apply the appropriate cross in column "Destination CFC".


Picture 1: in the default setting not all information is routed with destination CFC
2. If the required information element is not available, then a user defined information element of the appropriate type must be inserted.


Picture 2: The icon for the information catalogue

Click on the icon (see picture 2) or select the menu entry Insert $\rightarrow$ Information Catalogue. Thereafter a new window opens (see picture 3)


Picture 3: The information catalogue for user-defined information
3. Select the required information type from the catalogue and insert it at the appropriate location in the input/output matrix via drag\&drop.


Picture 4: information catalogue content (expanded)
If for example a simple new annunciation is required, select the type "single point" annunciation (SP). The classification ON/OFF or OPEN/CLOSE merely indicates how the pick-up and reset of the annunciation is indicated in the event logs.
The annunciation is positioned in the input/output matrix via drag \& drop.


Picture 5: the new annunciation in the input/output matrix
4. To rename the annunciation click on the text field and enter the new name. To route the appropriate source and destination of the annunciation, click on the appropriate column with the right mouse button and select the column entry. Input information to the CFC logic must be routed with a " $X$ " in the column "Destination CFC". Information derived from the CFC logic must be routed with a " $X$ " in the column "Source CFC". Other routing of the annunciation such as e.g. to LED or binary output or from binary input or service interface must additionally be done.

|  | Information |  |  |  | Destination |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | No. | Display text: | Long text: | Type | BO |  |  |  |  |  |  |  |  |  |  |  |  | LE | Buffer |  |  |  | S | C | B |  | CM |
|  |  |  |  |  | 1 | 2 | 3 | 4 | 56 | 67 | 78 | 9 | 10 | 011 | 12 | 131 | 1415 |  | , | 0 | S | T |  |  | C | D |  |
|  | 01820 | 51 picked up | 51 picked up | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $00 \times$ | X |  |  |  |  |
|  | 01825 | 51 TRIP | 51 TRIP | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bigcirc$ | x |  |  |  |  |
|  | 01804 | 50-2 TimeOut | 50-2 Time Out | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01814 | 50-1 TimeOut | 50-1 Time Out | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01824 | 51 Time Out | 51 Time Out | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01852 | 50-2 BLOCKED | 50-2 BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | x |  |  |  |  |
| $50 / 51$ Overcur. | 01851 | 50-1 BLOCKED | 50-1 BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | x |  |  |  |  |
|  | 01855 | 51 BLOCKED | 51 BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | x |  |  |  |  |
|  | 01714 | *BLK 50N/51N | - BLOCK 50N/51N | SP |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 01724 | >日LOCK $50 \mathrm{~N}-2$ | *BLOCK 50N-2 | SP |  |  | U |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01725 | >BLOCK 50N-1 | = BLOCK 50N-1 | SP |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01726 | \%BLOCK 51N | *BLOCK 51N | SP |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01756 | 50N/51N OFF | $50 \mathrm{~N} / 51 \mathrm{~N}$ is OFF | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  |  | x |  |  |  |  |
|  | 01757 | 50N/51NBLK | $50 \mathrm{~N} / 51 \mathrm{~N}$ is BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | x |  |  |  |  |
|  | 01758 | 50N/51N ACT | $50 \mathrm{~N} / 51 \mathrm{~N}$ is ACTIVE | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  |  | x |  |  |  |  |
|  | 01765 | 50N/51NPickedup | $50 \mathrm{~N} / 51 \mathrm{~N}$ picked up | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $00 \times$ | x |  |  |  |  |
|  | 01831 | $50 \mathrm{~N}-2$ picked up | $50 \mathrm{~N}-2$ picked up | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $00 \times$ | x |  |  |  |  |
|  | 01833 | 50N-2 TRIP | 50N-2 TRIP | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bigcirc$ | x |  |  |  |  |
|  | 01834 | $50 \mathrm{~N}-1$ picked up | $50 \mathrm{~N}-1$ picked up | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $00 \times$ | X |  |  |  |  |
|  | 01836 | 50N-1 TRIP | $50 \mathrm{~N}-1$ TRIP | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bigcirc$ | x |  |  |  |  |
|  | 01837 | 51 N picked up | 51 N picked up | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $00 \times$ | X |  |  |  |  |
|  | 01839 | 51 N TRIP | 51 N TRIP | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bigcirc$ | x |  |  |  |  |
|  | 01832 | 50N-2 TimeOut | 50 N -2 Time Out | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01835 | $50 \mathrm{~N}-1$ TimeOut | 50N-1 Time Out | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01838 | 51 N TimeOut | 51N Time Out | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  | 01854 | 50N-2 BLOCKED | 50N-2 BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | x |  |  |  |  |
|  | 01853 | 50N-1 BLOCKED | 50N-1 BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | X |  |  |  |  |
|  | 01856 | 51N BLOCKED | 51N BLOCKED | OUT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | $00 \times$ | X |  |  |  |  |
|  |  | Blocking | New Blocking signal | SP |  |  |  |  |  | U |  |  |  |  |  |  |  |  |  | 0 |  |  |  |  | X |  |  |
| 67 Direct. O/C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  |  | * | * |  |  |  |  |
| Measurem.Superv |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  | * |  |  |  | * |  |  |  |  |
| 79M Auto Recl. |  |  |  |  |  |  |  |  |  |  |  | * | * |  |  |  |  |  | * |  |  | * | * * | * |  |  |  |
| Fault Locator |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  |  | * | * |  |  |  |  |
| 50BF BkrFailure |  |  |  |  |  |  |  |  |  |  | * |  |  |  |  |  |  |  | * |  |  | * | * | * |  |  |  |
| Cntrl Authority |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  |  |  | * ${ }^{*}$ | * |  |  |  |
| Control Device |  |  |  |  | * | * | * |  |  |  |  |  |  | * | * | * | * |  | * |  |  |  | * | * * | * |  |  |
| Process Data |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  |  |  | * | * |  |  |  |
| Measurement |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  |  |  |  |  |  |  |  |

Picture 6: the new annunciation in the input/output matrix routed to the destination CFC
5. IMPORTANT: Save the settings! Afterwards the annunciation will be available in CFC.

Similar procedure applies to commands, measured values, counters etc.
Please note that commands with feed-back will create two lines in the input/output matrix. These lines cannot be separated. The first line contains allocation for the command output (typically routed to binary outputs), while the second line contains the feedback information associated with this command (typically derived from binary inputs).


Picture 7: a new command with feedback signal in the input/output matrix

