



## ***CP111 -***

***- driver for communication with CP-111/E control panels used to control MYCOM (MAYEKAWA) compressors***

***User's Manual***

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# 1. CPIII – driver for communication with CP-III/E control panels used to control MYCOM (MAYEKAWA) compressors

CPIII driver allows to exchange data between **asix** system and CP-III/E control panels used to MYCOM (MAYEKAWA) compressors. Communication is realized with use of RS-485 serial links.

Driver realizes the following functions:

- readout of current analog and binary digital values,
- readout and write of set values,
- readout of alarms and relaying them to the **asix** alarm system.

Parameterization of CPIII driver is performed with the use of Architect module.

## 1.1. Declaration of Transmission Channel

Declaration of the transmission channel using the CPIII driver requires a channel with the following parameters to be added to the *Current data* module:

**Standard** tab:

*Name:* logical name of the transmission channel  
*Driver:* CPIII

**CPIII** tab:

*Chanel parameters:*  
*address, port, [bauds, char, parity, stop]*

where:

*address* - address of a device in a network;  
transmission parameters of CPIII driver:  
*port* - serial port name;  
*bauds* - transmission speed in bauds;  
*char* - number of bits in a transmitted character;  
*parity* - parity check type (n-none, e-evenness, o-odd parity, m-mark, s-space);  
*stop* - number of stop bits.

If the transmission parameters are not defined, the following values are set:  
9600,7,e,1

**An exemplary channel declaration:**

*Name:* CPIII\_1

*Channel declaration:* 10, COM1

## 1.2. Variable Declaration

Addressing the variables of CPIII driver is based on description of CPIII device communication protocol (however, the values of particular variables are different from those described in the protocol description). In particular, one shouldn't use the multipliers described in the protocol, because the driver performs appropriate multiplication/division operations.

Declaration of variable address of CPIII driver has the following syntax:

Address	Meaning	Conversion Function of NOTHING_xxx type
D1	1 analog input	NOTHING_FP
D2	2 analog input	NOTHING_FP
D3	3 analog input	NOTHING_FP
D4	4 analog input	NOTHING_FP
D5	5 analog input	NOTHING_FP
D6	6 analog input	NOTHING_FP
D7	7 analog input	NOTHING_FP
D8	8 analog input	NOTHING_FP
D9	9 analog input	NOTHING_FP
D10	10 analog input	NOTHING_FP
D11	11 analog input	NOTHING_FP
D12	12 analog input	NOTHING_FP
D13	13 analog input	NOTHING_FP
D14	14 analog input	NOTHING_FP
D15	15 analog input	NOTHING_FP
D16	16 analog input	NOTHING_FP
D17	Working time in hours	NOTHING_DW
D18	as D17	NOTHING_DW
D19	Capacity control manipulated value (MV), calculated by PID controller, wanted slide valve position.	NOTHING_FP
D20	Superheat process value (PV); actual value of evaporator superheat in case of temperature control. example: chiller unit equipped with linear expansion valve.	NOTHING_FP
D21	Superheat manipulated value (MV), calculated by PID controller.	NOTHING_FP
D22	Liquid injection process value PV.	NOTHING_FP
D23	Liquid injection manipulated value (MV), calculated by PID controller.	NOTHING_FP
D24	fixed data : 000000	NOTHING_FP
D25	Setpoint unit start, cut-in value for controller. (Equivalent of D1 in setpoint write command of CCPIII device communication protocol).	NOTHING_FP
D26	Setpoint unit stop, cut-out value for controller. (Equivalent of D2 in setpoint write command of CCPIII device communication protocol).	NOTHING_FP
D27	Capacity control setpoint. (Equivalent of D3 in setpoint write command of CCPIII device communication protocol).	NOTHING_FP

D28	Setpoint superheat control - only applicable in case of temperature control. (Equivalent of D4 in setpoint write command of CCPIII device communication protocol)	NOTHING_FP
D29	Setpoint Liquid Injection, setpoint for liquid injection oil cooling. (Equivalent of D5 in setpoint write command of CCPIII device communication protocol).	NOTHING_FP
D30	fixed data : 000000	NOTHING_FP
D31	Current working mode: 10 : manual mode 15 : manual mode + datacomms on 20 : auto 25 : auto mode + datacomms on 30 : remote mode 35 : remote mode + datacomms on 40 : remote - auto mode 45 : remote -auto mode + datacomms on	NOTHING_BYTE
D31.n	Current working mode depending on the <i>n</i> element: D31.0 – equals 1 for automatic mode, and 0 for manual mode D31.1 – equals 1 for „datacomms“ mode, and 0 in the opposite case D31.2 – equals 1 for remote mode („remote“), and 0 in the opposite case	NOTHING_BYTE
D32	Digital inputs	NOTHING_DW
D32.n	Single bit of digital input. The „n“ may have the value from the range 0 - 31. It corresponds to digital inputs from the range 1 – 32, e.g. D32.0 corresponds to 1 digital input. The variable has the value of 1 if the given digital input is set, otherwise it takes the value of 0.	NOTHING_BYTE
D33	Status of all alarms.	NOTHING_DW
D33.n	Status of singular alarm. The variable takes the value of 1 if the given alarm is active, otherwise it takes 0. The number „n“ identifies singular alarm and is the number of bit in status word of alarms in the range 0 - 31. Examples: D33.0 – „start fail“ (00000001status word of alarms) D33.1 – „oil pressure low“ (00000002 status word of alarms) D33.2 – „discharge pressure high“ (status word of alarms 00000004) D33.3 – “discharge temperature high” (00000008 status word of alarms), and so on.	NOTHING_BYTE
D100	Special control. The variable takes the value: 0 – „remote start“ OFF & „100% lock“ OFF 1 – „remote start“ OFF & „100% lock“ ON 2 – „remote start“ ON & „100% lock“ OFF 3 – „remote start“ ON & „100% lock“ ON  (Equivalent of D6 in setpoint write command of CCPIII device communication protocol).	NOTHING_BYTE
D100.n	Special control depending on the <i>n</i> element.	NOTHING_BYTE

	D100.0 – „100% lock” D100.1 – „remote start” The 0 value corresponds to OFF control, and the 0 value corresponds to ON control.	
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### 1.3. Alarm Generation

The CPIII device driver with the interval not longer than the value defined by the *Event\_check\_period* parameter checks the state of the list of device events and generates alarms for all new detected events. Alarm check is realized at every readout of data from the device, even when the data are read from the device to refresh variable values. So, check of alarm state may be performed more often than it is determined by *Event\_check\_period* parameter if there are variables the refresh period of which is shorter than the value of this parameter. The number of **asix** system alarm is the sum of the number of bit in a status word of CPIII device and the value determined by the *Alarms\_base* parameter. If the *Alarms\_base* parameter is not declared, alarms will not be generated.

Generating alarm, the driver transmits a CPIII device address as the parameter of this alarm. The address may be used in the text associated with the given alarm.

#### Example:

If the *Alarms\_base* parameter has the value of 5 and 'start fail' alarm with the mask in alarms' status word equaled 00000001 (bit no. 0), the alarm with the number of 5 will be generated. Simultaneously, the value with D33.0 address will take 1.

### 1.4. CPIII Driver Parameters

CPIII driver parameters are declared in: Architect > *Miscellaneous* module > *Directly entered options* tab.

The CPIII driver may be configured using the '**CPIII**' section placed in the application initialization file or sections having the same name as channel names. The parameters placed in the '**CPIII**' section apply to all devices. The parameters placed in other sections refer to a specified device.

- Section name: CPIII**
- Option name: Alarms\_base**
- Option value: number**

Meaning - allows to specify numeration of alarms for each device. After adding the value of this parameter to the number of bit in alarms' status word, we will get the number of alarm in **asix** system. Bits are numbered w.e.f. 0.

Default value - - 1 (no alarm service).

Parameter:

*number* - parameter must be positive number.

**Section name: CPIII**

**Option name: Global\_alarms**

**Option value: YES/NO**

Meaning - the item controls the way of transferring alarms read from remote devices to the alarm system of **asix**.

Default value - by default, the alarms are transferred to the alarm system as global alarms (transferred to the alarm system by means of the function `AsixAddAlarmGlobalMili()`). Setting the value of the item `GLOBAL_ALARMS` on `NO` causes that the alarms are transferred to the alarm system by means of the function `AsixAddAlarmMili()`.

**Section name: CPIII**

**Option name: Event\_check\_period**

**Option value: number**

Meaning - the option declares the interval between checking the state of events and alarm generation.

Default value - 30

Parameter:

*number* - time in seconds.

**Section name: CPIII**

**Option name: Log\_file**

**Option value: file\_name[,log\_file\_size]**

Meaning - the item allows to define a file to which all diagnostic messages of CPIII driver transmission channel and all messages describing the telegrams received and sent by CPIII driver will be written. If `LOG_FILE` does not define the full path, then the log file will be created in the current directory; the log file should be used only while the **asix** start-up.

Default value - by default, the log file is not created.

Parameter:

*file\_name* - log file name;

*log\_file\_size* - maximal log file size in megabytes;

**Section name: CPIII**

**Option name: Retries**

**Option value: number**

Meaning - the item allows to define maximal number of trials to do the command in case of transmission errors.

Default value - 3

**Section name: CPIII**

**Option name: Timeout**

**Option value: number**

Meaning - allows to specify a waiting time for arriving the first character of an answer sent from a specified device.

Default value - 500

Parameter:

*number* - time in milliseconds;

**Section name: CPIII**

**Option name: Special\_control**

**Option value: number**

Meaning - the option defines the default value of D100 variable in the case when the driver has received the first command to write the variable from the range D25-D29. The values of all the variables for write, i.e. D25-D29 and D100, are written simultaneously during one operation of transmission. Before performing his operation the driver reads the values of D25-D29 variables and sends them to device in unchangeable form - with the exception of the variable the value of which is to be changed. Therefore, only the value of demanded variable is changed. For the D100 variable it is not possible to read its previous value, but any value must be sent to device – in such case the parameter determines the value of D100 variable. The parameter doesn't have sense when the first write operation concerns the D100 variable, i.e. when the user determined its value before the change of the rest variables.

Default value - 0

**Section name: CPIII**

**Option name: Pressure\_control**

**Option value: YES/NO**

Meaning - the option defines the multiplier used at readout/write of variables: D25, D26 i D27. If 'YES', the multiplier equals 100; if 'NO', the multiplier equals 10.

Default value - 'NO'

### **An exemplary parameterization of CPIII driver:**

Channel declaration:

*Name:* CPIII\_1

*Channel parameters:* 5, COM1,57600,8,none,1

*Name:* CPIII\_2

*Channel parameters:* 5, COM2

*Name:* CPIII\_3

*Channel parameters:* 6, COM2

Declaration of parameters:

**Section name: CPIII**

**Option name: Global\_alarms**

**Option value: TAK**

- Section name: CPIII*
- Option name: Event\_check\_period*
- Option value: 60*
  
- Section name: CPIII\_2*
- Option name: Event\_check\_period*
- Option value: 30*

The *Global\_alarms* parameter applies to all devices. The *Event\_check\_period* parameter determines 60-second time interval between checking the state of events and alarm generation on all devices, with the exception of CPIII\_2 channel device (for CPIII\_2 channel the interval equals 30 seconds).