CAST
User Manual
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1 Introduction

Thank you for purchasing the \texttt{OneProd}_{\texttt{MVX}} monitoring and predictive maintenance system.

This product is delivered with a “toolbox” designed to perform various start-up and maintenance operations on \texttt{MVX: OneProd}_{\texttt{CAST}}

\texttt{OneProd}_{\texttt{CAST}} can be used to:

- View internal installation parameter specific to each \texttt{MVX} (serial number, licence number, version of the embedded software (firmware), fixed IP address, etc).
- View defects detected by \texttt{MVX}
- View the status of logical inputs and outputs on \texttt{MVX}
- View the values of operating condition parameters
- View and print log files of \texttt{MVX}.
- Change addressing parameters for \texttt{MVX} (IP addresses)
- Change the licence granted to \texttt{MVX} (upgrade)
- Upgrade the internal software (firmware)

\texttt{OneProd}_{\texttt{CAST}} is not intended for common operating of \texttt{MVX} but only for start-up and maintenance operations.

The present manual is typically suited for 5.1 firmware \texttt{MVX} versions.

\begin{center}
\framebox[.5\textwidth]{
\textbf{Warning}

Using the Expert mode of \texttt{CAST} allows acting on \texttt{MVX} internal parameters and can then lead to intentionally or unintentionally stopping programmed monitoring.

The use of \texttt{CAST} is then restricted to well-informed operators.
}
\end{center}
2 Installation

2.1 Minimum requirements

- Pentium III (or equivalent) processor, 700 MHz
- Operating system: Windows 2000 or Windows XP
- RAM: 256 MB minimum, 512 MB recommended
- Display: 1024 x 768 minimum
- 1 Ethernet network port, 100 Mbits

This software needs Microsoft.NET Framework 2 to be already installed on your computer.

Microsoft.NET Framework 2 is included into the MVX package.

2.2 Microsoft Framework 2.0 installation

You have first to check if Microsoft.NET Framework 2 is already installed on your computer or not.

In order to do that, you can use the “Add or Remove Programs” menu of the Windows Control Panel.

If Microsoft.NET Framework 2 is not listed, you have to install it before launching the CAST installation. Please run the “dotnetfx.exe” program located in subdirectory CSM+VIO_3.x.x.x \ Install .NET Framework 2.0 on the OneProdMVX CD-ROM.
Click on "Next" in the first screen, then on "Install" in the second screen, after reading and accepting the terms of the licence.

Microsoft.NET Framework 2.0 installation only takes a few minutes.

When this installation is completed then you can start installing CAST.

### 2.3 Installing OneProd-CAST

Run `Install.exe` from subdirectory `CAST_3.5.3` on the CDROM provided with OneProdMVX

Select the language for the installation program and confirm by clicking on "OK".

The installation folder can be selected in the second screen.
Validate the following two screens:
The last screen is used to select some final installation options:

Click on “Finish” to complete the installation of CAST.
3 Using CAST: General points

3.1 Privileges

Upon launching of the program, a screen is displayed that allows to select the language and the operating mode of CAST:

After selecting the language, please select the operating mode you want to launch:

- **Browse** mode: free access but does not allow any change: click on “Browse”.

- **Expert (Configure)** mode: access is password-protected which allows to act on MVX: click on “Configure”.

![Screen shot of language and operating mode selection](image)

**Warning**

Using the *Expert* mode of CAST allows acting on MVX internal parameters and can then lead to intentionally or unintentionally stopping programmed monitoring.

The use of CAST is then restricted to well-informed operators.

This is the reason why the Expert mode is password-protected. We strongly recommend that the default password be changed. The default password is: **Oneprod** (use lower and upper-case letters as indicated).

To change the password, please:

- Enter the initial password
- Click on “Modif password”
- Enter the new password
- Confirm the new password
- Click on “Update”

![Password change screen](image)
3.2 Connection to MVX

After selection of the CAST operating mode, the program displays a blank home page.

The first operation to carry out when using CAST consists in specifying the MVX to which to connect.

To do so, enter in the corresponding field:

- Either the serial number of the MVX (if dynamic IP network)
- Or the IP address of the MVX (if fixed IP network)

Simply by clicking in the input area, one can display a pull-down list including the MVX instruments specified last.

One just needs then to select an IP address or a serial number in this list.
This password is property of the MVX you want to communicate with. It is necessary for any kind of communication.

By default, this password is factory-set to MVX. It can be modified using CAST (2nd tab).

Once you have blanked the box or once you begin to enter a password, a complete first tab page opens.

There are 8 or 9 tabs, depending on the mode you’re using. (Tab “Firmware installation” does not exist in consultation mode)
The first operation to begin with consists in pointing out the **MVX** that you want to reach.

In order to do that, please type on the top side of the page:

- Either the **MVX** serial number (in the case of a dynamical IP network),
- Or directly the **MVX** IP address (in the case of a fixed IP address network).

In clicking into the IP address zone, you can see the scrolling list of the last **MVX** that have been reached with **CAST**.

Then you just have to choose an IP address or a serial number in the list.

---

**Each time CAST is connected to a «new» MVX, it is strongly recommended to begin with a «ping» test, in order to verify that an Ethernet communication is possible with that MVX.**

Once that test is successful, then it is recommended to display the MVX information (§5.1) and to verify it before launching any other operation.
4 Communication Tools

Please first click on the « Tools » tab as below:

4.1: Ping test

4.2: Retrieving the MVX MAC address

4.3: Looking for an IP address on the network
The « Tools » tab of CAST allows to run 3 different functions:

4.1 Ping test :

The « Ping » test verifies that a target (answering to a request) does exist on the network.
It and also allows:
   o To retrieve an IP address if you know the Hostname (serial number of an MVX).
   (or)
   o To retrieve the Hostname (serial number of an MVX) if you know its IP address.

Please first type the serial number on the left (into the red rectangle) and then click on the “Ping” button.

Note 1: This test can’t guarantee that the target which answers is currently an MVX.
Note 2: The communication password isn’t required for the « Ping » test.

4.2 Retrieving the MVX MAC address

MAC address corresponds to the physical address of an Ethernet port.

There are 2 MAC addresses for an MVX: one for each Ethernet port.
Each MVX has different MAC addresses, which permits to distinguish them on a network.
This function allows to retrieve an MVX MAC address once you know its IP address.

Please first type the IP address on the left (into the red rectangle) and then click on the “Search MAC address” button.

4.3 Looking for an IP address on the network

This is a scanning function: CAST looks for a particular MAC address on the network.
Beforehand you have to type the MAC address and to restrict the research into a fork: two IP addresses.
Please enter the correct values into the red rectangles and click on the “Search IP address” button.
Note that this test may take several tens of seconds to be achieved.
5 Visual display of information

5.1 Display of information specific to each MVX

The display of this information is a basic operation, with which one should start each time CAST is used with a given MVX.

Click on button “Read information” in the first tab: after a few seconds, the corresponding table is filled out:

A quick view on this table allows checking for essential elements:

- Receiving information evidences that the MVX is correctly addressed and can respond.
- With fixed IPs, once can check that the expected MVX (which is identified through its serial number) responds at the specified IP address.
- One can check the rights granted to the MVX (number of channels, possible options)
- One can check the MVX firmware version: i.e. 5.0.0.23 here.
- We suggest that the date and time be checked also.
5.2 Display of channel and defect status

In the first tab, the second section, “MVX states”, allows viewing the possible status of defects for each channel, and globally for the MVX.

Click on “Read MVX states” in the first tab.

In the example below:

<table>
<thead>
<tr>
<th>MVX States</th>
<th>Configuration counter</th>
<th>Files not transmitted to XPR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel</td>
<td>State</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Short circuit</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Open circuit</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Not Used</td>
<td></td>
</tr>
</tbody>
</table>

The global status is:

- The MVX is Sensor defect,
- The MVX is loaded with settings defining channels 1 to 8,
- Channel 2 is in Short-circuit mode,
- Channel 4 is in Open-circuit mode,
- Channels 1, 3, 5 to 8 are OK,
- Channels 9 to (32) have not been defined in the set-up file loaded in MVX.
5.3 Display of logical input status

In the “Inputs/Outputs” tab, one can view the status of the 4 logical inputs of a MVX-160 or of the 8 logical inputs of a MVX-320.

To do so, click on the “Read” button.

In the above example, logical input #2 is active.

Note 1: Click again on “Read” to refresh the screen.

Note 2: In the case of MVX-160, it is normal that the 4 inputs that are not available are displayed as active.

Note 3: Fields “Relay outputs” and “Indicators” are neither accessible, nor significant.
### 5.4 Internal processing information

This tab can be used to visualize live the internal processing of **MVX**.

It allows well informed operators to verify that the different operating conditions are rightfully detected and how often they appear.

This can be useful in order to optimise the monitoring strategy in the case of complex or no irregular cycle machineries.

In the upper table, each line shows one Acquisition & Processing Task (TAT) that is active in **MVX** at the instant of reading.

In the lower table, each line matches with a status change for the task that has been selected in the upper table.

<table>
<thead>
<tr>
<th>Number of recording files</th>
<th>Time of the last status change</th>
<th>Number of measurement</th>
<th>Select here the task you want to monitor (in the second table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>11:04:29</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>5</td>
<td>11:04:30</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>1</td>
<td>11:04:31</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>1</td>
<td>11:04:32</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>1</td>
<td>11:04:33</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>1</td>
<td>11:04:34</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>1</td>
<td>11:04:35</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>1</td>
<td>11:04:36</td>
<td>190</td>
<td>190</td>
</tr>
</tbody>
</table>

Click to empty the table
5.5 TAT time diagram

This tab allows drawing live status evolution of the different tasks that \textbf{MVX} should perform.

Such advanced function is useful to optimise \textbf{MVX} setup in the worst use cases: complex operating conditions machine (wind turbine), several machines with multiple conditions each, etc.

Drawing of the diagrams starts when clicking on “Display” (or “Afficher”) and it stops when clicking on “Stop” (or “Arreter”).

One diagram may include several pages

\textbf{Warning}: Re-starting a diagram causes the previous one to be deleted

Moving the mouse cursor on a task allows displaying (on the left and below) the precise triggering time and the task duration.

\textbf{Legend:}
- \textit{Waiting for trigger}
- \textit{Processing}
- \textit{Waiting for stability}
- \textit{Recording}
6 Configuration of IP addressing

Rules for the use of Ethernet ports:

1 - It is recommended to use preferably the port B. This port can handle the communication with the software OneProd (XPR, CAST, MSC, VIO) and PLC via Modbus TCP.

2 - If Modbus PLC is on a different network then connect it on port A

6.1 Configuration of a MVX with fixed IP

The second tab “Configuration” includes a section to define the fixed IP of a MVX.

MVX addressing on an Ethernet network can sometimes prove a delicate operation to implement. It must be carried out in collaboration with your computer specialists. The user is strongly urged to refer to Chapter 7 (connection of MVX to an Ethernet network) in the MVX user manual prior to any operation on the addressing mode.

The configuration of MVX IP is not available in consultation mode.

To configure a MVX with a fixed IP address, follow the instructions below:

1 – Network DNS suffixe (optional)

2 – Select: Fixed IP

3 – Enter the fixed IP address of MVX

4 – Enter subnet mask

5 – Enter default gateway if required

5 – Click on button “Configure”

Clicking on button “Configure” results in the MVX being restarted and changes the way in which it shall be addressed after this restart.
6.2 Configuration of a MVX with dynamic IP

Reminder:

- MVX Version $\geq$ V5.1: By default, upon delivery, MVX starts with a dynamic IP and sets itself to IP addresses within the range 169.254.x.y in the absence of DHCP server.
- MVX Version $<$ V5.1: before update to V5.1, in the absence of DHCP server addresses are fixed to 192.168.1.100 and 192.168.1.101.

The second tab “Configuration” includes a button allowing to reconfigure the MVX with a dynamic IP address.

MVX addressing on an Ethernet network can sometimes prove a delicate operation to implement. It must be carried out in collaboration with your computer specialists.

The user is strongly urged to refer to Chapter 5 (connection of MVX to an Ethernet network) in the MVX user manual prior to any operation on the addressing mode.

The configuration of MVX IP is not available in consultation mode.

To configure a MVX with a dynamic IP address, just click on button “Configure dynamic IP address” in the second tab of CAST.

Note: To carry out this operation, the fixed IP address of MVX must be known first.

If this fixed IP address is lost, you must reset the MVX: see § 7.4 of MVX user manual.
7 Setting the RS485 interface

The RS485 interface is used to communicate with the MVX using Modbus RTU protocol. It is possible to adjust the settings from the second tab "Configuration":

![Setting RS485 interface interface](image)

Recommended configuration:
- Speed : 19200 or 9600
- Data : 8 bits
- Parity : Even
- Stop bit : 1
8 Modifications to the firmware

8.1 Modification of the MVX licence

The licence number of a MVX can be changed. This function is available in Expert mode only.

This operation allows changing rights granted to a MVX:
- Maximum number of channels for MVX,
- Function levels (Easy or Premium),
- Possible options.

A licence number is valid for a single MVX, which is defined by its serial number.

In the second tab "Configuration", enter the licence number and click on “Send to MVX”.

CAUTION
Changing the licence number will cause the MVX to restart. The monitoring will then be interrupted for about 2 minutes.

When this operation is completed and after restart of the MVX, it is recommended to go back to the first tab and check that the licence number and allocated rights have been updated by clicking on button “Read information”.
8.2 Upgrading the firmware

8.2.1 Upgrading the firmware to MVX 5.1: important note

- After updating to version V5.1, MVX cannot be "downgraded" to a previous version without factory return. This is due to the new management of Ethernet ports.
- Modification of default IP address:
  - MVX Version ≥ V5.1: By default, upon delivery, MVX starts with a dynamic IP and sets itself to IP addresses within the range 169.254.x.y in the absence of DHCP server.
  - MVX Version < V5.1: before update to V5.1, in the absence of DHCP server addresses are fixed to 192.168.1.100 and 192.168.1.101.

8.2.2 Upgrading the firmware to MVX V4.x: important note

CAST allows upgrading MVX firmware in most of the situations, except when MVX is currently in a V1, V2 or V3 version and you want to upgrade it to V4.

In fact, V4 firmware is based on a new operating system. A specific software (MVX Updater) is required to upgrade MVX firmware from an operating system to the other.

Illustration:

<table>
<thead>
<tr>
<th>« Current » version</th>
<th>« New » version</th>
<th>Software to be used for upgrade operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1.x</td>
<td>V1.x</td>
<td>CAST</td>
</tr>
<tr>
<td>V1.x</td>
<td>V2.x</td>
<td>CAST</td>
</tr>
<tr>
<td>V2.x</td>
<td>V2.x</td>
<td>CAST</td>
</tr>
<tr>
<td>V2.x</td>
<td>V3.x</td>
<td>CAST</td>
</tr>
<tr>
<td>V3.x</td>
<td>V3.x</td>
<td>CAST</td>
</tr>
<tr>
<td>V3.x</td>
<td>V4.x</td>
<td>MVX Updater</td>
</tr>
<tr>
<td>V3.x</td>
<td>V5.x</td>
<td>Upgrade in 2 phases: First V3 &gt;&gt; V4 (MVX Updater) then V4 &gt;&gt; V5 (CAST)</td>
</tr>
<tr>
<td>V4.x</td>
<td>V4.x</td>
<td>CAST</td>
</tr>
<tr>
<td>V4.x</td>
<td>V5.x</td>
<td>CAST</td>
</tr>
</tbody>
</table>

We recommend consulting the specific user manual of MVX Updater before trying to perform an upgrade.

(The following instructions are applicable only for CAST)
8.2.3 Select the source directory

Upgrading the firmware can prove useful if one wants to benefit from improvements and new functions as soon as they are available.

⚠️ Before upgrading the MVX firmware, make sure that it is compatible with the respective versions of XPR, CSM & VIO that are currently being used.

Please notice in particular that 2.x MVX firmware versions can only be used with 2.x CSM & VIO versions, and with version 4.0 of XPR.

Upgrade is available in Expert mode only. The corresponding tab “Firmware installation” does not exist in Consultation mode.

To upgrade the firmware of a MVX, a copy of the firmware must be present on a computer station connected to MVX, i.e., on the station from which CAST is used.

The firmware copy can originate from the hard disk or from the CD-ROM. It is not recommended that a firmware copy be used directly from a network drive. In this case, it should be copied onto the PC first.

In the “Firmware installation” tab, click on button and select the directory containing the firmware version to install in MVX. Example: directory “Firmware_5.1.0”.

8.2.4 Launching the upgrade

After notching the corresponding options “Install OS” and “Fixed IP address” boxes, please click on “Install” to launch the upgrading operation.

MVX must remain connected during the entire upgrading phase.

The progress of file transfer can be monitored using the table below (“Status” column). Transfer is completed when the user regains control of the program.

Simple firmware upgrade duration is about 30s, plus MVX boot time.

Complete firmware + OS upgrade duration is about 3 minutes, plus MVX boot time. Nevertheless monitoring tasks are assumed until reboot.
9 Miscellaneous

9.1 Retrieval of log files

Log files are files in which MVX records various dated events as they come along.

File “Log Ws” is devoted to information transfer between MVX and the user’s computer station.

CAST allows reading these files or printing them in order for Acoem specialists to analyse possible dysfunctions.

CAST also allows reading internal functional indicator levels (*):
- CPU load for RT indicators
- Available RAM memory
- Available Compact-Flash memory
- …

(*): only with version V5.x MVX firmware version.

Note: interpretation of log files data may require Acoem assistance
1 – Choose the file to be uploaded

2 – Click here to upload the file

3 – Click here to access printing menu
9.2 Retrieval of parameter file lists

CAST allows reading the list of files that constitute the application settings of MVX, as well as its measurement files, in order to allow Acoem specialists to analyse possible dysfunctions.

To do so, click on button “Read directories” in the last tab “Files”.

- The Parameters directory usually contains two files: “ConfGene.bin” and “ConfVoies.bin”
- The TAT directory contains one file per operating condition of each machine
- The Measurements directory contains files that have yet to be retrieved by XPR. It is generally empty if CSM has been used to set up MVX.

Usual operations:
Click here to access to the 3 files lists

Click here in order to upload the files on your PC
>C:\Program Files\OneproD\CAST\[IP @ or serial number]

Click here in order to also upload the measurement (result) files on your PC
>C:\Program Files\OneproD\CAST\[IP @ or serial number]

See § 9.3
9.3 Complete deletion of a configuration

CAST also allows deleting MVX settings completely:

Clicking on button “Erase configuration” (see above) will delete the parameter settings.

⚠️ CAUTION

Deleting the configuration is a MAJOR operation that causes the MVX MONITORING TO STOP!

9.4 Time setting of MVX

Select the second tab “Configuration” and click on button “Update date and time”.

MVX will be set to the same date and time as the PC hosting CAST.

This operation is not available in “Browse” mode.

Time setting is instantaneous. It is recommended to go back to the first tab and check that date and time have been properly updated by clicking on button “Read information”.

Click
9.5 *Init of the particle counter “CGI”*

This feature allows for setting a GCI indicator (particle counter) to zero or to a specific value.

In a general way, one set a particle counter to zero just after a major maintenance operation on the corresponding machine.

Setting a GCI counter to a specific value can be useful in the case where an MVX has been replaced. Such possibility allows for downloading the old count to the new MVX.

1. Please type the channel number of the GCI index
2. Then type the value you want to set GCI
3. Launch setup of the GCI value
9.6 *Init of HTTPS port (expert user only!)*

This feature allows for changing HTTPS current working port on the target **MVX**.

1 – Please type the **old** HTTPS port

2 – Type here the **new** HTTPS port

3 – Launch the changing of HTTPS port

This change causes **MVX** to reboot.

After **MVX** reboot, one should update “HTTPS port” field in the upper CADST banner.

A Hard Reset of MVX returns to port 443: see MVX user manual § 7.4
9.7 Changing MVX communication password

As written in chapter 3.2 each MVX has its own communication password.

This password is requisite for all the communications with MVX, as well as they operate from XPR, CSM, VIO or CAST.

By default this parameter is factory-set to MVX.

Customising this password is possible with CAST, using the “Configuration” tab.

**Warning**

Changing MVX communication password must be also done in VIO, CSM and XPR, otherwise all the communication would abort.

1 - Please enter here the **old** MVX communication password

2 - Please enter here the **new** MVX communication password

3 - Launch password update
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For more information, visit our website at www.acoemgroup.com

200 chemin des Ormeaux
69578 LIMONEST – FRANCE
Tel.: +33 (0)4 72 52 48 00
www.acoemgroup.com

Asia
Tel. +66 (2) 7112 293 – Fax +66 (2) 7112 293

South America
Tel. +55 (11) 5089 6460 – Fax +55 (11) 5089 6454