Cynap:
Crestron and AMX
template integration

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Cynap Template included

1 Introduction

Cynap is ready to be controlled by any RMS vendor on the market.

WolfVision offers ready-made Crestron and AMX templates for a very convenient integration. The included interface allows to fully control and set every aspect of your RMS configuration.

The provided templates can be customized and/or adapted for your specific RMS integration.

Apart from available AMX and Crestron templates, any RMS system on the market can be programmed to control Cynap by using our WolfProt protocol via websocket. A simple and fast way to get access to Cynap on your RMS solution.

Our WolfProt Protocol aims to offer versatility and sophisticated access when it comes to develop your next RMS integration.

The guide is separated into two parts. *Part 1* covers the integration of the provided AMX and Crestron templates on your controller and *Part 2* explains how to use the WolfProt API´s to customize your RMS system in connection with Cynap. It is important to read about Cynap specifics and settings in *this document* before heading to *WolfProt Programmer´s Guide* to "build or customize your own template".

1.1 Disclaimer

This manual is intended for RMS developers. Therefore it is assumed that you already have a good understanding of AMX/Crestron programming and integration
(see http://www.howtoprogramcrestron.com/resources.html for Crestron integration
or http://www.amx.com/products/NetLinxStudio.asp for an AMX integration).

The templates contain the whole range of Cynap functions, most of the time not all are needed for each customer. We strongly advise to adapt our demonstration templates to your customer needs before installing the provided demonstration template.

Knowledge of TCP/IP networking is beneficial. It is also assumed that your processor and touch panel/terminals are installed and do function correctly and reside on the same LAN as Cynap.

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Integrating the downloaded Cynap RMS templates

2 WolfProt Basics

WolfProt is an easy accessible Protocol that allows you to control various functions on Cynap and Wolfvision Visualizers. The connection between your RMS and Cynap is password protected and first needs to be activated (Enable and set RMS user).

2.1 Cynap Introduction

Cynap is a collaboration device which supports a large number of resources (videos, office formats or images), several input sources (on 2 HDMI in) on up to 4 windows as well as internal functions such as Recording/Streaming and Annotation, Whiteboard or WebRTC.

2.2 WolfProt Network Ports

Please make sure that ports TCP 50915/50917 and TCP 50916 are open.

Port #	Feature	Description
7	WOL	ECHO or WOL command to initiate power-on on Cynap (used only in provided template)
50913	WolfVision Device Discovery	Device Discovery (WOL) Port for WolfVision devices
50915	Cynap WolfProt	Communication between RMS and Cynap
50916	Visualizer WolfProt	Communication between RMS and Visualizer
50917	Cynap WolfProt protected by TLS	SSL encrypted connection to Cynap

For additional port descriptions please refer to the networking guide of Cynap.

2.3 Help/Support

We do provide a number of support documents to help you integrate Cynap into your implementation.

We are, however, unable to support you with skills in programming languages needed to build your RMS solution.

2.4 Basic setup with Wolfvision provided Crestron or AMX templates

IDE

Make sure that you got your RMS IDE up to date and ready. For example, to seed a Crestron master console with the necessary runtimes and touch-panel-UI you want to use the

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Crestron MasterInstaller to download the required components with its latest available version.
Crestron Dev Primer: http://www.crestron.com/downloads/pdf/product_misc/sw-simpl_primer.pdf [1]

Or, for AMX, use the AMX WebUpdate to download the necessary IDE (e.g. NetLinx Studio 4) and its components.
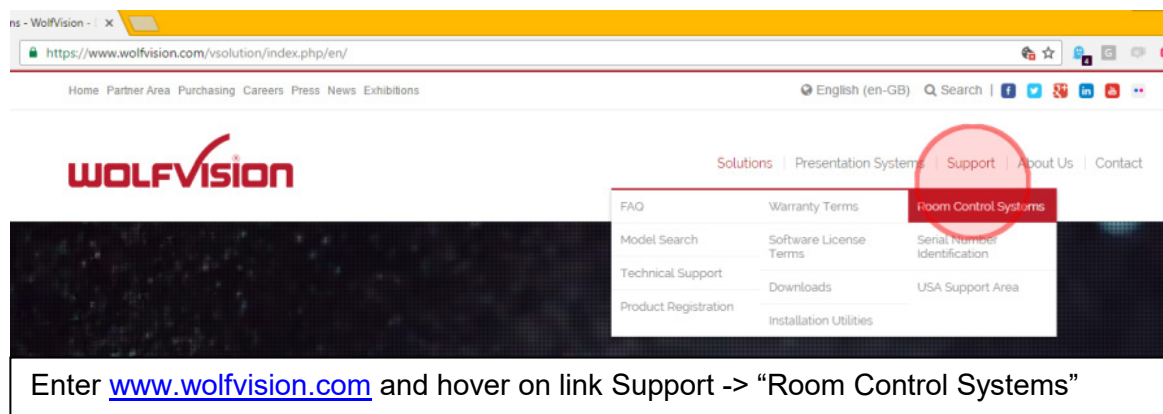AMX Netlinx Programming
Language: http://www.amx.com//assets/manuals/NetLinx.LanguageReferenceGuide.pdf [2]

We do provide fully working templates(controller/layout) for AMX and Crestron which can be used as-is or can be altered to suit your needs.

2.5 Download RMS Templates from wolfvision.com

Templates for AMX and Crestron RMS do exist and can be downloaded from our website:
URL: https://www.wolfvision.com/vsolution/index.php/en/support/room-control-systems

Select the available Crestron or AMX template and download the provided ZIP (Crestron) or .axw (AMX) file.

Enter www.wolfvision.com and hover on link Support -> "Room Control Systems"

On page **Room Control System** click on your RMS brand (at this time we do provide templates for **Crestron** and **AMX**).

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[1] {Crestron: Technical Documentation #1}
[2] {AMX NetLinx Programming Language Guide#2}

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Download 2016-09-22_Cynap_Crestron.zip for Crestron or 2016-09-22_Cynap_AMX.axw for AMX from our RMS support website.

Note: please make sure that the template you use corresponds with your Cynap´s firmware version.

![WolfVision logo]

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3. Setup

3.1 The Cynap Application Environment

3.1.1 Connectivity

The WolfProt API´s consists of a variety of Get and Set functions to control Cynap or change settings via WolfProt.

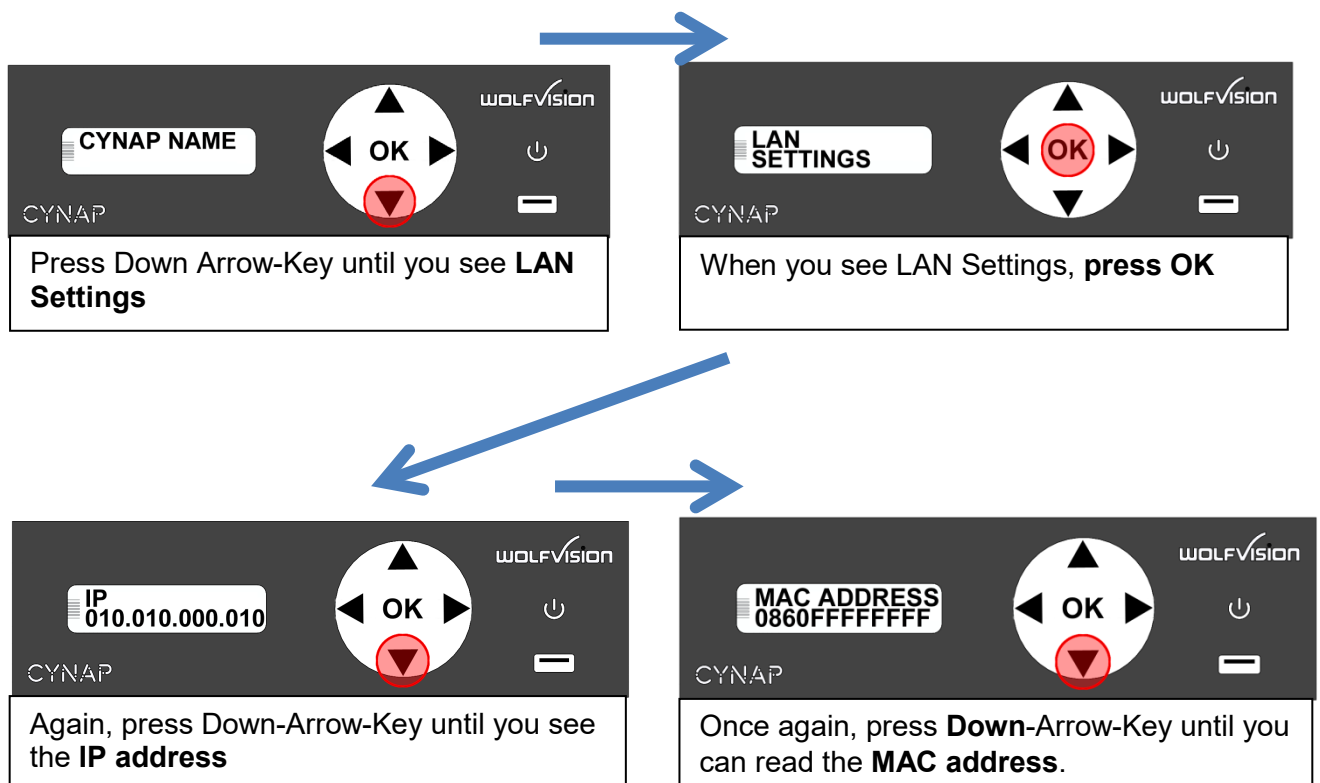Almost all of the WolfProt commands require an authorized session.

Basic steps to connect your RMS with Cynap
1. Get the IP and MAC address of your Cynap
2. Set RMS User Password in Cynap's settings
3. Change the template based on Cynap´s IP and MAC and RMS User Password
4. Compile and upload the files to your RMS console
5. Make sure that **TCP Port 50915** (reserved for Cynap) and **TCP Port 50916** (reserved for Visualizers) are not blocked by a firewall

3.1.2 Get the IP and MAC Address of your Cynap

Either press the Down-Arrows on the front panel to have the LAN Settings (incl. MAC address) displayed or use the internet browser to get the information from the Settings-pages.

3.2 Get MAC address information from Front Panel

Press Down Arrow-Key until you see **LAN Settings**

When you see LAN Settings, **press OK**

Again, press Down-Arrow-Key until you see the **IP address**

Once again, press **Down**-Arrow-Key until you can read the **MAC address**.

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The same information can also be fetched from the Browser when you´re connected to
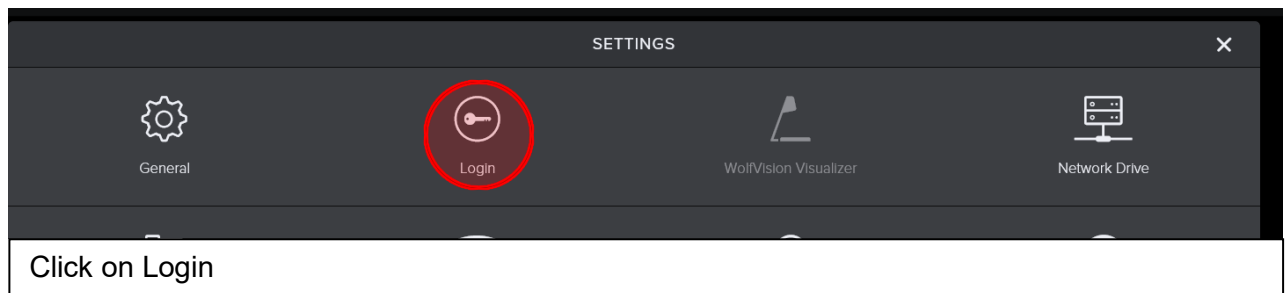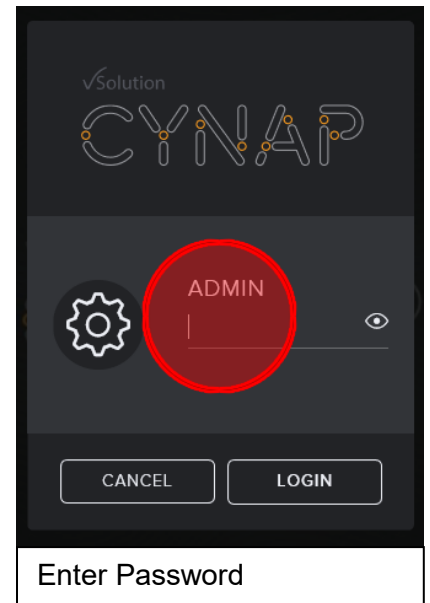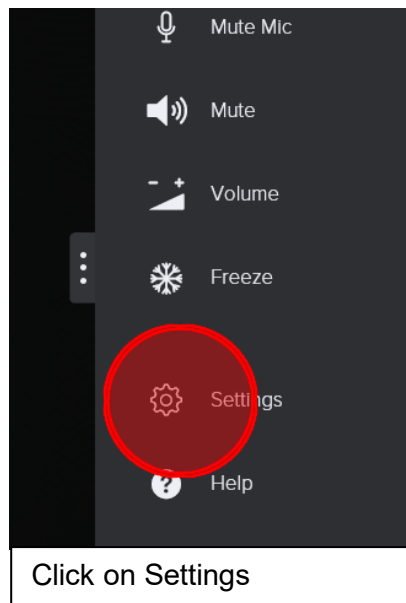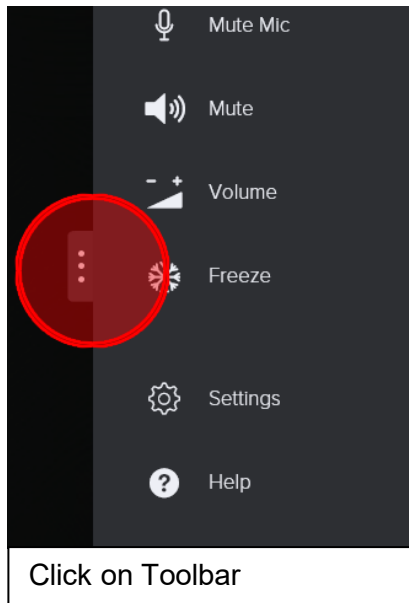Cynap´s Settings (Settings -> LAN).

3.3 Set up and Activate RMS User
Before you can create an authorized RMS user session, you need to activate the RMS user.

Start a browser and type in Cynap´s IP address to gain access to Cynap´s menu.

First click on the Cynap Toolbar indicator and then on Settings. Enter your admin password
on the Login-Popup and click Login to access the Settings.

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Mute Mic	Mute Mic	CYNAP
Mute	Mute	
Volume	Volume	ADMIN
Freeze	Freeze	
Settings	Settings	
Help	Help	CANCEL LOGIN
Click on Toolbar	**Click on Settings**	**Enter Password**

SETTINGS ✕

General   Login   WolfVision Visualizer   Network Drive

Click on Login

Activate RMS User option and set your desired password

1. Enable RMS User,   2. Type in password. Once to create and twice to verify
2. Don´t forget to SAVE/APPLY changes on Cynap

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Integrating the downloaded template

Wolfvision provides a template for Crestron and one for AMX. To transfer the necessary files you need to have a RMS development environment (download the latest version via MasterInstaller (Crestron) or WebUpdate (AMX).

The procedure to prepare the template before it´s sent to each controller/terminal is similar on both platforms and consists of replacing the existing default values in the template configuration:

1. Replacing the existing sample Cynap-IP
2. Replacing the existing MAC address of Cynap (for WOL)
3. Replacing the password of your defined RMS User

3.4 Crestron

3.4.1 Module Format

The modules have been provided as Simpl+ modules (.usp and .ush) embedded in a Simpl Windows module (.umc).

A file has also been provided in .smw format to allow for an easy integration into your project.

A touch panel file has been provided for X-Panels which can be used without any additional developing.

3.4.2 Features

All the features of Cynap are included in the template.

3.4.3 Using the modules in your program

The various modules are described in the template PDF file.

3.4.4 Content of unzipped Crestron Template file

File	Content	Action
Cynap.smw	SimplWindows demo program file detailing the use of the module	Main file
Cynap_Client.usp	Simpl+ Source Code	Simpl+ source file and can be opened and modified in Simpl+
Cynap_Client.ush	Simpl+ Source Code	generated from the same name .usp file and CAN NOT be opened or modified
Cynap.vtp	TVPro demo Touchpanel project file to use with the SimplWindows program	The .vtp file can be opened in VTPro and modified as desired
Cynap.vtz	VTPro Touchpanel project file	Compilation of .vtp – the vtz file CANNOT be opened in VTPro

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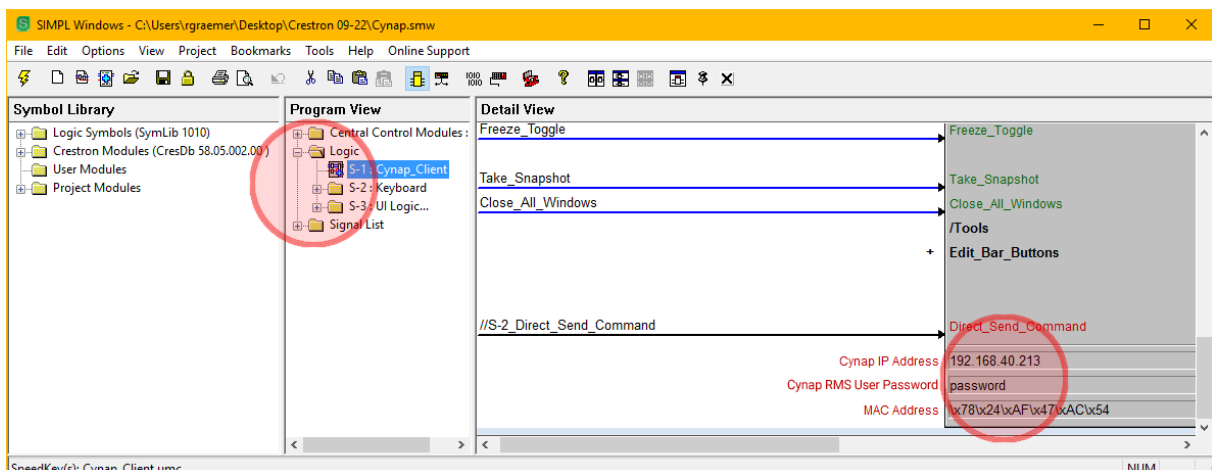| Cynap.sig | Crestron Testmanager Signal File | This is the test file for the same name .smw file. The .sig file cannot be opened/modified in SimplWindows |
Cynap.lpz	Yoiur built 3 Series SimplWindows compiled code	Uploaded to processor
Cynap.sgd_	Smart Graphics Data file generated by Visiontool Pro-e for Simpl Windows	Cannot be modified or opened in Visiontool
Cynap_Module_Help.pdf	User Guide	To be read
Cynap_documentation.pdf	Developer Guide	To be read

Unzip the zipped Crestron Template and double-click on file Cynap.smw. Save the UMC, USP and USH files in your project folder. Perform a re-sync. Add the UMC into your program.

Simpl loads the file and all you have to do is heading to the section where you can change the required parameters (IP, Mac and RMS User Password) and save the file.

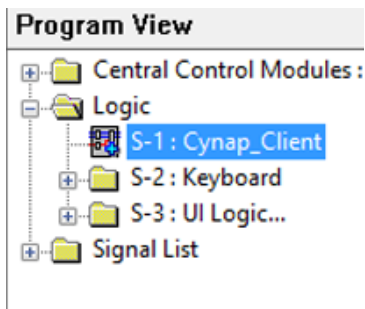### 3.4.5 Replacing Cynap template default values

Step 1: transfer the compiled file to Crestron Controller

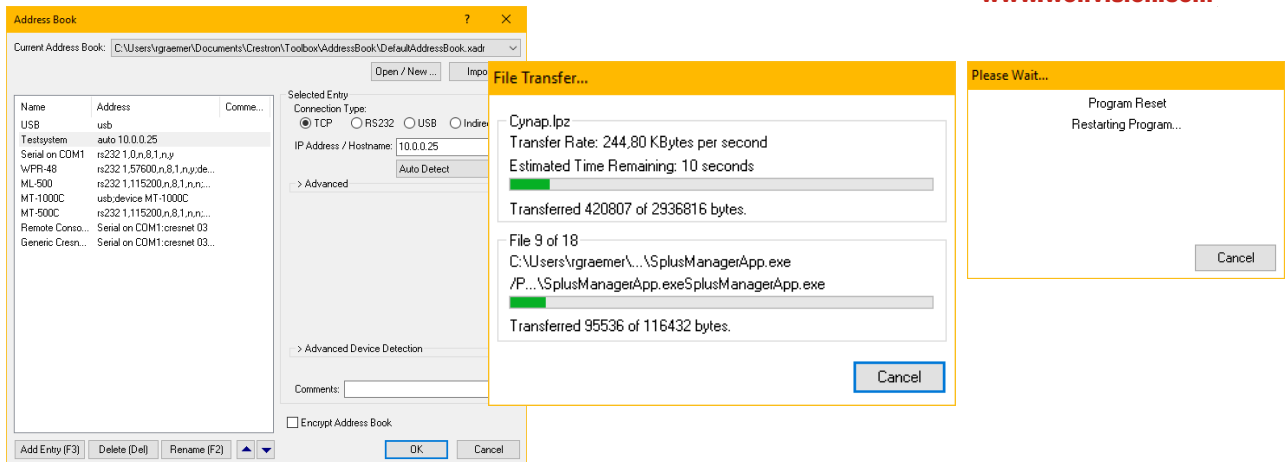Overview on where and what to change in the template

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Click on S-1: Cynap_Client

Program View
- Central Control Modules :
- Logic
  - S-1 : Cynap_Client
  - S-2 : Keyboard
  - S-3 : UI Logic...
- Signal List

In Program View open Logic and select **S-1: Cynap client**

Detail View

+ **Edit_Bar_Buttons**

Direct_Send_Command

Cynap IP Address	192.168.40.213
Cynap RMS User Password	password
MAC Address	\x78\x24\xAF\x47\xAC\x54

On the Detail View window head down to the bottom and change the parameters **for Cynap IP Address**, **Cynap RMS User Password** and the **MAC Address** of your Cynap.
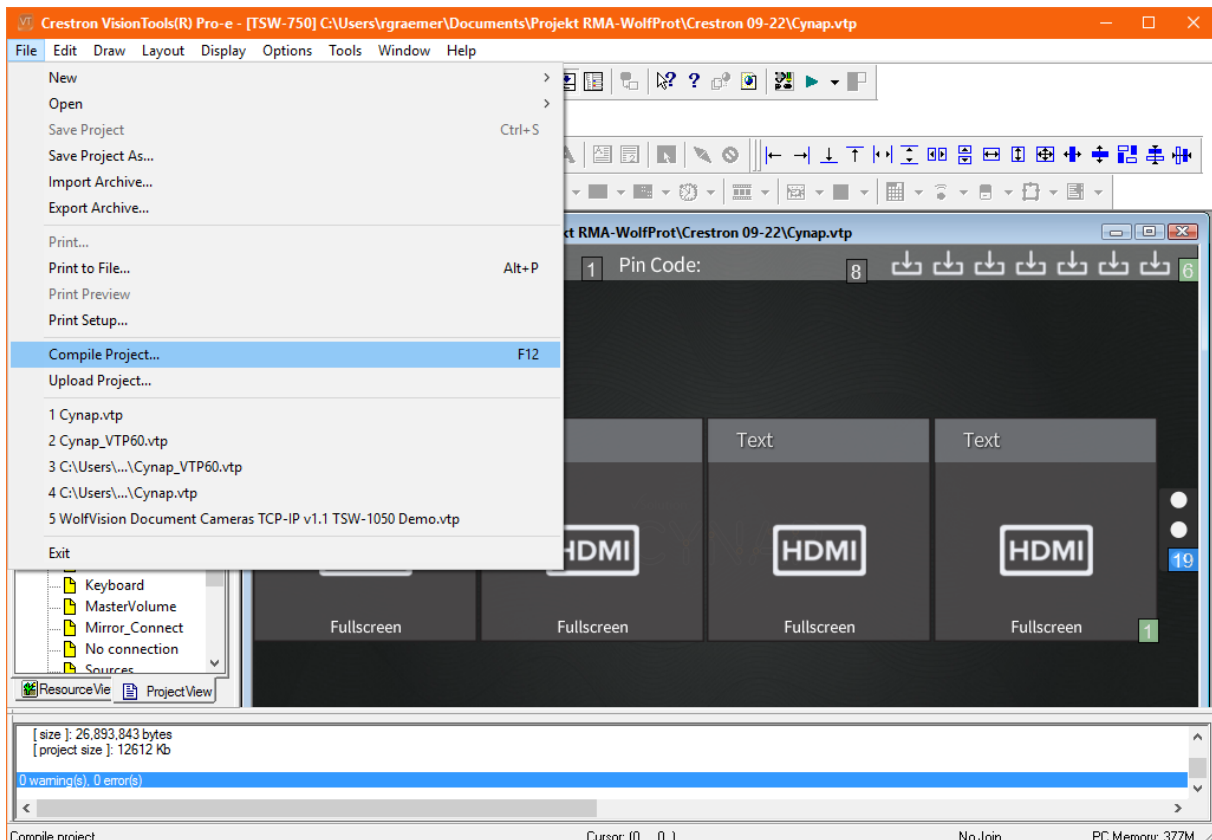
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Compile and then transfer the build to your Crestron controller

Step 2: Transfer the layout file to your Crestron Touch Terminal

Double-click on Cynap.vtp and press F12 or click on Compile Project… and then press the OK button on the succeeding transfer dialog.

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3.5 AMX
Module Format
The modules have been provided as Simpl+ modules (.usp and .ush) embedded in a Simpl Windows module (.umc).

A file has also been provided in .smw format to allow for an easy integration into your project.

A touch panel design file is included for X-Panels which can be used without any additional developing.

3.5.1 Features
All the features of Cynap are included in the template.

3.5.2 Using the modules in your program
Please refer to the PDF included in the template on the various modules.

Download the available .axw file from our website.

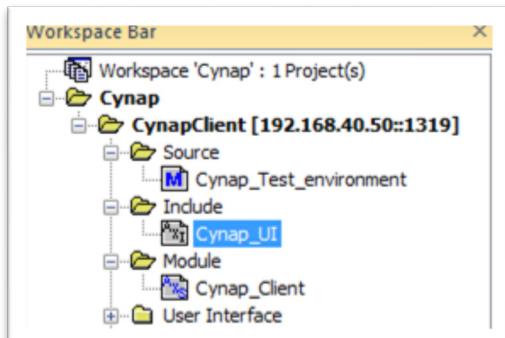### 3.5.3 Content of unzipped AMX Template file

File	Content	Action
Cynap.apw	Project file	Used in NetLinx Studio to build and transfer template
Cynap.TP4	Touch Panel Design	Used in TPDESIGN4 and can be modified
Cynap_Client.axs	Client source file	Used in NetLinx4 Studio/editor and can be modified
Cynap_Test_environment.axs	Test file	Used in NetLinx4 Studio/editor and can be modified
Cynap_UI.axi	UI source file	Used in NetLinx4 Studio/editor and can be modified
CypapUI and COMM modules.pdf	Description of AMX template	To be read

3.5.4 Setup AMX Template
Please make sure that you´ve got the latest version of NetLinx Studio installed on your system.

Download the .axw file from our website and store it on your computer. Double-Click on the downloaded file and it will expand itself within NetLinx Studio.

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3.5.5 Changing default values

Open tree and open **Include->Cynap_UI**

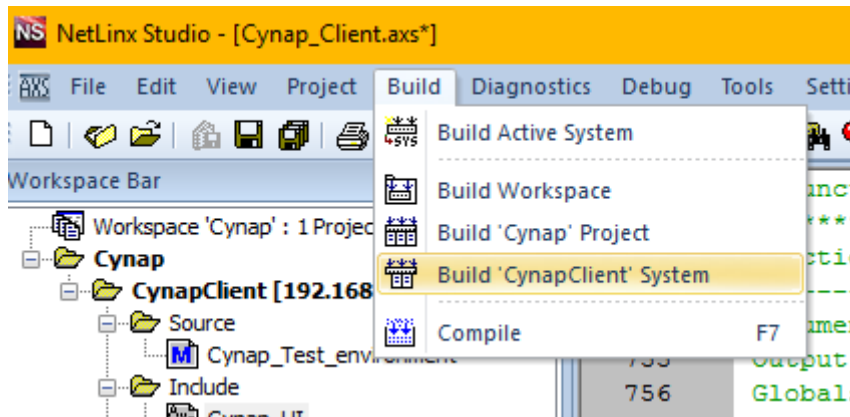In Cynap_UI: **Search (Ctrl-f)** for the **variable** section and change the following variables and its values:

```
298    (*********************************************************)
299    (*              VARIABLE DEFINITIONS GO BELOW           *)
300    (*********************************************************)
301   DEFINE_VARIABLE
302
303    Integer nDebug = 0
304    Char Server_IP[64] = '192.168.40.213'
305    Char Password[64] = 'password'
306    Char MAC_Address[16] = {$78,$24,$AF,$47,$AC,$54}
307    Integer Number_of_Browse_Lines  = 6
308
309    Integer gnKeyboard
310
```

Change value of **Server_IP** to your Cynap-IP
Change value of **Password** to match the defined RMS User password
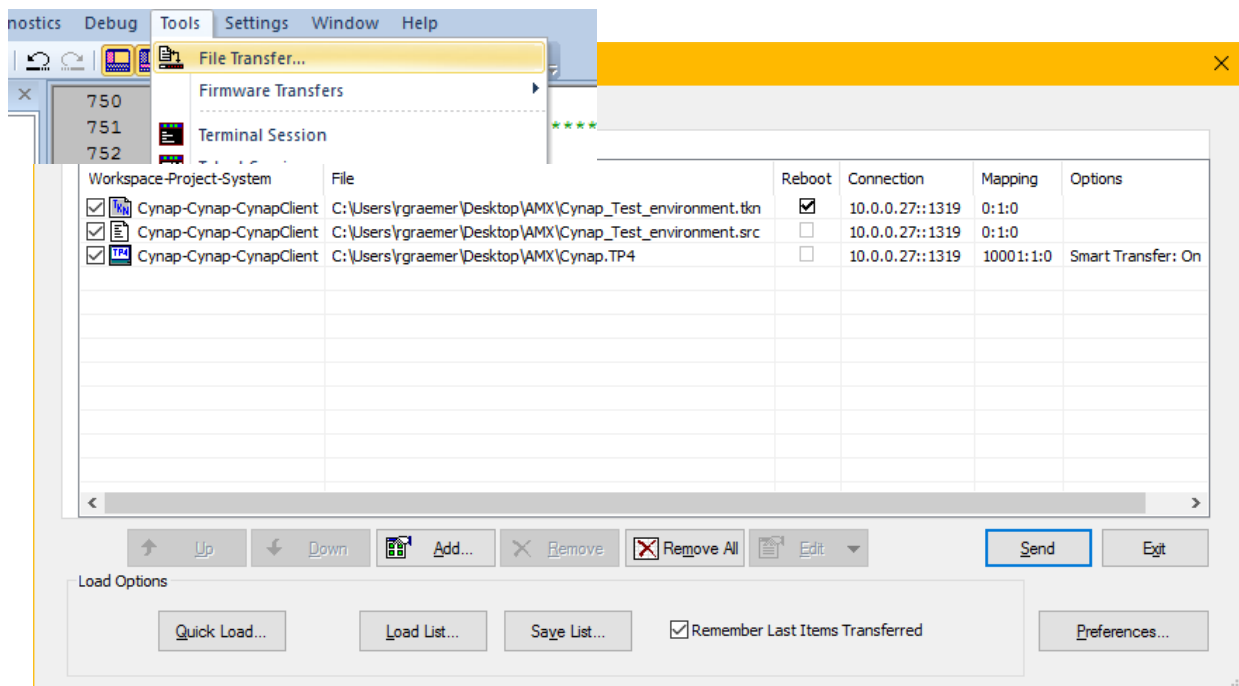and replace the existing **MAC Adress** with your Cynap´s MAC address

3.5.6 Build AMX template

Step 1: build and then transfer the files

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After **changing** and **saving the axs-file** build the CynapClient System by selecting **Build** in NetLinx Studio

Send the build to your AMX controller by selecting Tools->File transfer

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3.6 Troubleshooting

Command issues
Check that the MAC and IP address as well as all TCP/UDP ports are configured correctly.
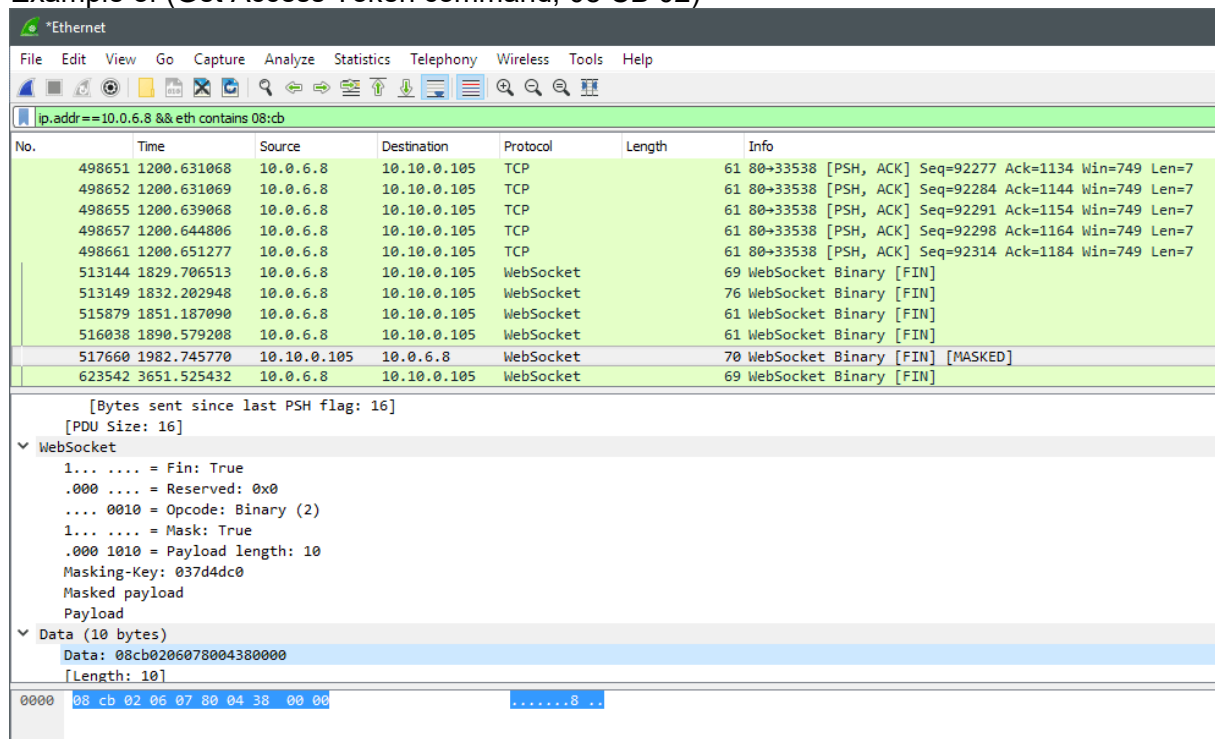
Start Wireshark
Using Wireshark to verify your get and set commands

Start collecting the traffic on the interface used for Cynap communication (e.g. Ethernet) – Important: connect to Cynap after the start of traffic collection, otherwise Wireshark won´t be able to initiate properly and won´t catch traffic on the WebSocket protocol.

Filter the IP address of your Cynap and your command in hex.
For instance: ip.addr == 192.168.10.10 && eth contains 08:cb

Example of (Get Access Token command, 08 CB 02)

Authorization issues
Check that the Room Management System user has been set up with the same corresponding password (on both ends).

Make sure that the command you´re sending (e.g SET command) is being covered by the necessary Access Level of your login.

Network issues
Commandline: ping the gateway of your network and issue an arp –a to get a list of IP and MAC address combinations to check if your Cynap MAC address is found.

Device issues
Check that the Cynap module is executed on the processor.

Check that the layout file has been transferred to your touch terminal.

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4 Limitations

Cynap's streaming services can cause significant increase in network traffic which might interfere with the Crestron or AMX processor.

It is highly recommended to follow your RMS brand's network guide lines in any setup.

Our provided RMS templates are based on the respective firmware releases. Protocol changes happen and new commands will be added with every new release of an updated firmware. We therefore advise to match the provided template with its firmware release number.

Please contact us if you need to support a certain firmware version and need its corresponding compatible RMS template.

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5 Glossary

Term	Description
AMX	AMX LLC, a manufacturer of commercial and residential control systems
Crestron	Manufacturer of home automation systems, building and campus control systems.
WolfProt	High Definition Media Interface, standardized interface to digitally transmit picture and sound
Miracast	
BYOD	Bring Your Own Device: mobile devices
WOL	Wake-On-LAN: broadcast message to specific MAC address
Cynap Source Button	
Cynap Toolbar	
RMS	Room Management System

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